FROM THE MAKERS OF Mountain Biking UK

1001 Mountain Bike Tips

THE ULTIMATE GUIDE TO MTB

BOOST YOUR SKILLS

ESSENTIAL ADVICE FROM COACHES, MECHANICS & EXPERT RIDERS

HOW TO...

- SORT OUT YOUR CORNERING
- READ THE TRAIL LIKE A PRO
- SET UP YOUR SUSPENSION
- LAUNCH JUMPS & DROPS
- GET BIKE FIT QUICK

KNOW YOUR E-BIKE

TOP SET-UP, TUNING & RIDING TECHNIQUES

NEXT LEVEL

HOW TO MASTER OFF-ROAD RIDING

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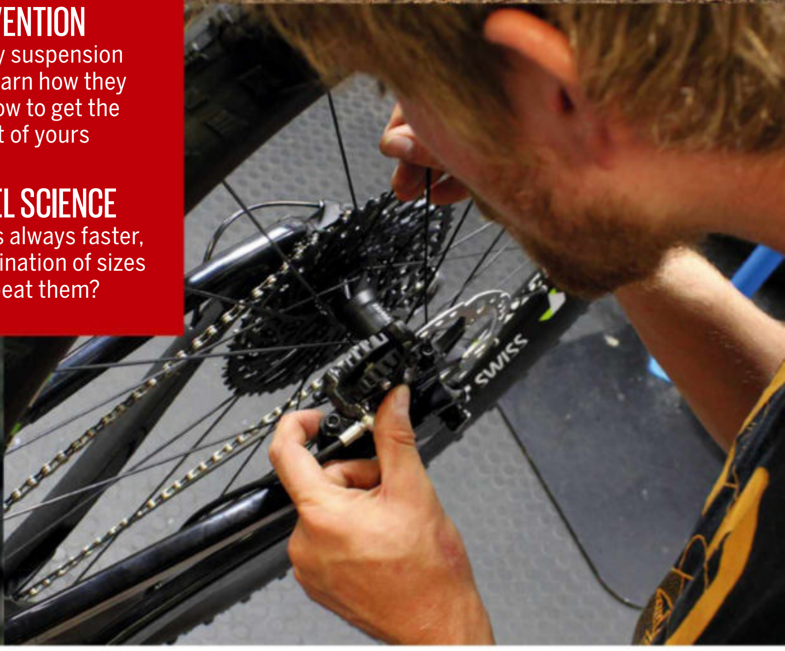
WELCOME

This special edition is packed with expert advice to help you get the most from your mountain bike and riding. In the following pages, you'll find many helpful tutorials and tips for beginners to advanced riders. We show you how to get the most out of every ride by improving your fitness, sharpening your skills and learning some suspension set-up essentials. We've worked with *Mountain Biking UK*, the UK's best-selling MTB magazine, and some of the sport's top riders, racers and coaches to bring you *1001 Mountain Bike Tips*, your complete guide to mountain biking. We hope you enjoy flicking through the pages.



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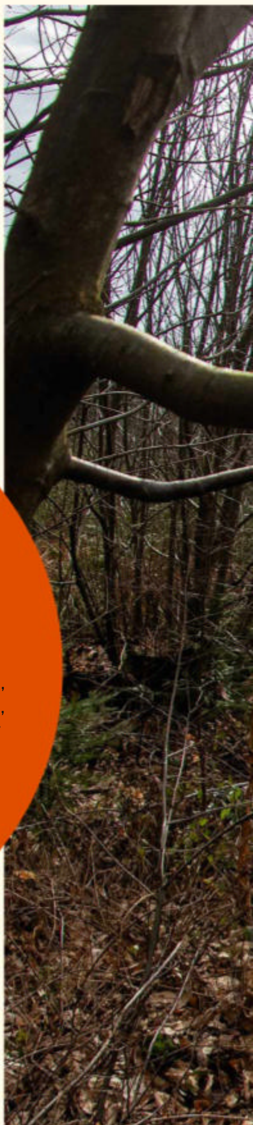
SKILLS & DRILLS



ESSENTIAL SKILLS FOR NEW MOUNTAIN BIKERS

Coach to the pros **Olly Morris** shares his top tips for aspiring shredders

It's fantastic to see the world of mountain biking growing at the rate it is, with people of all abilities and ages getting involved. The amazing thing about our sport is that you can buy a bike and immediately start riding off-road – with no training, you can just pedal off into the woods to have fun. However, there are some basic pointers that'll help improve your experience (and make riding a little safer) if you're new to mountain biking. I've broken these down into Key Skills, which is what you need to do on the bike, and Key Controls, explaining how to set up your brakes, gears and dropper seatpost.

01

STAND UP

One of the first things any mountain biker must learn is how to comfortably stand up on a bike while it's rolling along. Imagine you're standing on the ground, and you want maximum balance and stability. What do you do? I assume you'd find level ground, your legs would be energised (ready to move) and you wouldn't stand on your tiptoes. If you transfer this across to standing on the pedals, the first point is to keep your cranks level (your flat ground), then apply weight through your heels (not standing on your tiptoes) plus keep your legs energised and ready to move. Once you're balanced and comfortable standing up while rolling along, the next step is to practise standing up and pedalling. It's useful to pull on the handlebar to help you balance and give you some leverage when applying power to the pedals.

01

HOLD ON

The key here is to stay light, loose and relaxed. Grip the bar tightly enough that your palms don't slip, but not so much that your hands get fatigued. If you're gripping hard then you'll tense up through your arms and shoulders, too. Also, make sure you're not leaning on your bar – this makes it hard to balance because your weight on it makes the bar move. Instead, use your core to support your upper body. The bar is there for directional control and the pedals are there to provide a platform. To help you stop leaning on the bar, keep a bend in your elbows. This can be tricky, but if you make it second nature from the outset, it'll help immensely as the technicality of the trails you're riding increases.

03

LOOK DOWN THE TRAIL

When people are new to mountain biking, it's common for them to have their eyes down watching their front wheel. However, this won't stop you crashing – in fact, it makes accidents more likely because you won't be looking where you're going. Practise looking further down the trail so you can see what's coming next and start preparing for it. For example, if you see a climb ahead you'll know to select the correct gear for pedalling up it, or if there's a corner coming up you'll need to apply the brakes to slow down before you reach it. How far down the trail should you look? Focus on whatever the next 'obstacle' is, so if you're riding along a straight and can see a corner, that's what you want to focus on. It can take some time to do this consistently, so practise consciously until it becomes the norm. You'll find keeping your eyes up helps you ride trails with more 'flow'.

PRO-FILE

OLLY MORRIS

JOB Skills coach for Pro Ride

CREDENTIALS As well as being the co-owner of Pro Ride, Bristol-based Olly is the performance coach of downhill star Laurie Greenland and also races DH himself, at national and World Cup level.

PRO RIDE
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04

RIDE RELAXED

This may seem obvious (and it's something that helps in most aspects of life), but try to relax. When you're new to riding it can be extremely hard to do this, so the first step is to successfully execute the other key skills of standing up, holding on and looking ahead. Try to keep your muscles relaxed and breathe steadily. I see many riders, of all levels, holding their breath when they're nervous or tackling a challenging section of trail. This only makes it harder to ride, so try to breathe normally. It's easy to assume that if your muscles are tight you're more likely to stay upright, but it actually has the opposite effect. I'd advise allowing the bike to move freely under you as that'll give you more balance.

BRAKES

First, make sure both brake levers are set up so you can easily reach them without moving your hands at all. Loosen the bar clamp and position the lever so that when your hand is on the grip and your index finger is extended it sits comfortably near the end of the lever. You want the levers at a slight downward angle, about 45 degrees – remember, you brake most going downhill so don't have them pointing to the ground. When learning to ride, the key is to get comfortable with brake feel. When we get scared we often lock them up, but brakes aren't just an on/off toggle. Look at them like a volume control – you can adjust the amount of pressure depending on the trail. You can 'feather' them lightly when you want to scrub off just a little speed. Learning the feel, or 'modulation', of your brakes in the early stages of riding will really help you develop your technique.

GEARS

Most modern MTBs have a 1x drivetrain, meaning you only change gear at the back so only need one shifter. Some bikes have two, or even three, chainrings at the front so will have two shifters. You use your thumb to operate most shifters, sometimes your index finger too. As with brakes, take time to set the shifter up so you can reach it without moving your hand and it takes the minimum effort to change gear. Experiment with its position so it feels comfy whether you're seated or standing. As for choosing the correct gear and timing your shifting, the trick is to plan ahead. Changing gear usually requires a full pedal rotation for the chain to shift to the correct sprocket on your cassette. If you're approaching a climb, change into an easier gear (the larger cogs) in good time; as you near a descent, shift onto a smaller sprocket.

DROPPER SEATPOST

Not everyone has a dropper post, but they're fairly standard on modern full-suspension bikes as well as more expensive hardtails. Once you've tried one we're pretty sure you won't want to go back to a regular post! Again, set up the dropper's remote lever in a comfortable, easy-to-use position on the bar. Next, set the post height in the seat tube so that when it's fully extended the saddle is in your optimum seated pedalling position. To check this, make sure your leg doesn't quite reach full extension as you pedal – if it does, lower the post a little. Dropper posts are really useful to get the saddle out of the way and create some space to move about on the bike when you're descending. However, if you're new to riding it's really easy to forget to put the post down when you're about to descend. A good tip is to adjust your dropper just after you've selected a gear.

IS THIS TRAIL FOR YOU?

CHOOSE THE RIGHT TRAILS

Knowing the essential skills and set-up tips is one thing, but making sure you ride trails that are within, or close to, your ability level is really important. You don't want to find yourself on a steep, rocky descent before you're ready because it'll only put you off riding harder trails if you scare yourself.

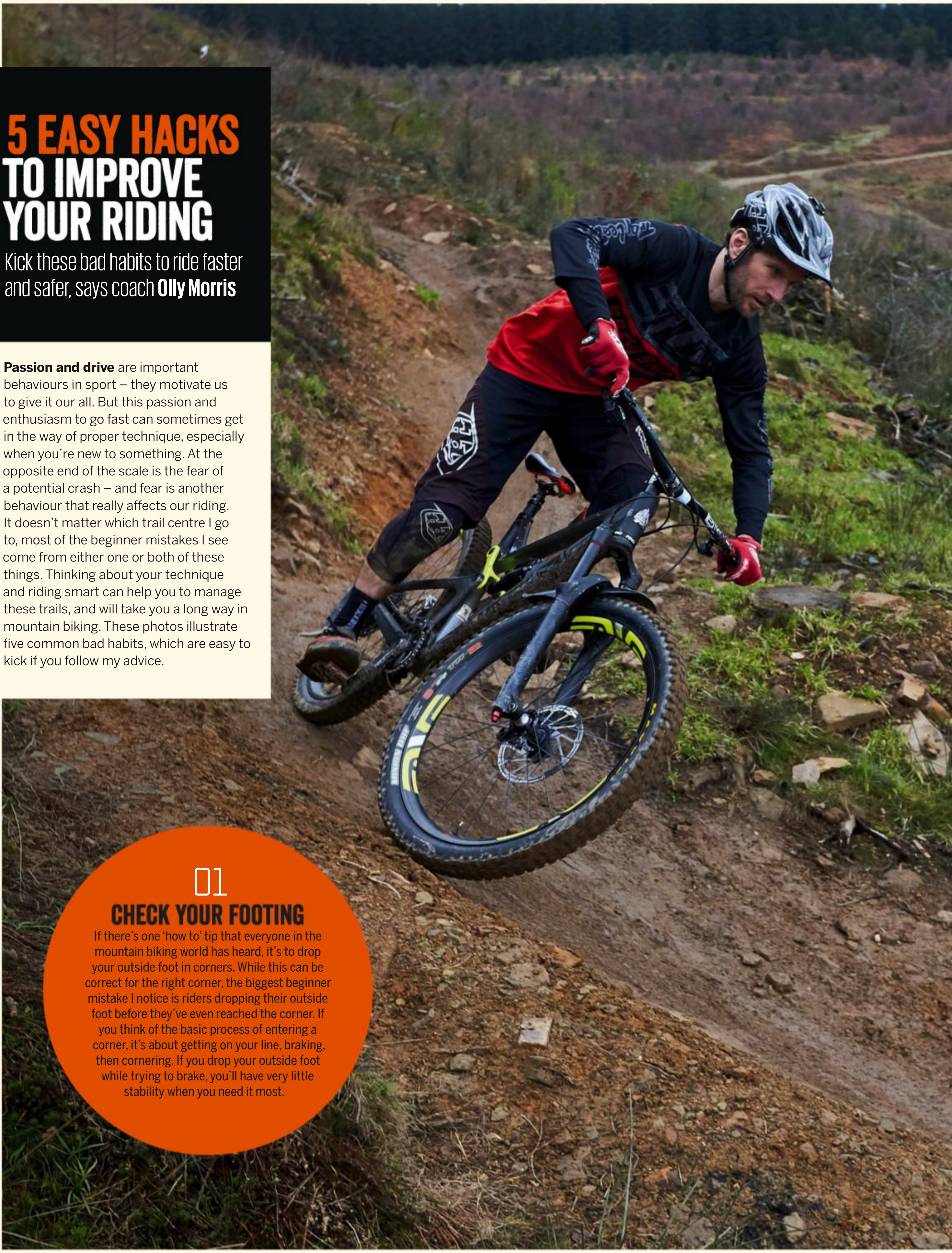
All trail centres grade their routes by difficulty, most using a similar system to skiing with green, blue, red and black-graded options, green being the easiest. Bike parks and centres with downhill tracks also incorporate an 'orange dots' system, from one to three dots, one being the easiest. It's worth noting that difficulty ratings do vary between trail centres and bike parks, meaning that a red trail at one riding spot may be graded black at another, so always take that into consideration when selecting your route. Green trails are family-friendly, often on wide gravel tracks, so, depending on how new to riding you are, kick off with the green or, for a little more fun, give the blue trails a go.

As you move up the grades, the trails will become rougher, with more jumps and drops (tricky obstacles often have 'chicken runs' to the side), plus steeper sections. Progress onto these as your confidence and skills improve.

5 EASY HACKS TO IMPROVE YOUR RIDING

Kick these bad habits to ride faster and safer, says coach **Olly Morris**

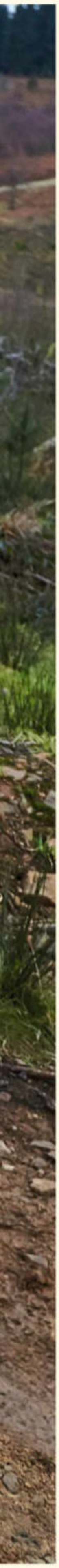
Passion and drive are important behaviours in sport – they motivate us to give it our all. But this passion and enthusiasm to go fast can sometimes get in the way of proper technique, especially when you're new to something. At the opposite end of the scale is the fear of a potential crash – and fear is another behaviour that really affects our riding. It doesn't matter which trail centre I go to, most of the beginner mistakes I see come from either one or both of these things. Thinking about your technique and riding smart can help you to manage these trails, and will take you a long way in mountain biking. These photos illustrate five common bad habits, which are easy to kick if you follow my advice.



01

CHECK YOUR FOOTING

If there's one 'how to' tip that everyone in the mountain biking world has heard, it's to drop your outside foot in corners. While this can be correct for the right corner, the biggest beginner mistake I notice is riders dropping their outside foot before they've even reached the corner. If you think of the basic process of entering a corner, it's about getting on your line, braking, then cornering. If you drop your outside foot while trying to brake, you'll have very little stability when you need it most.



02

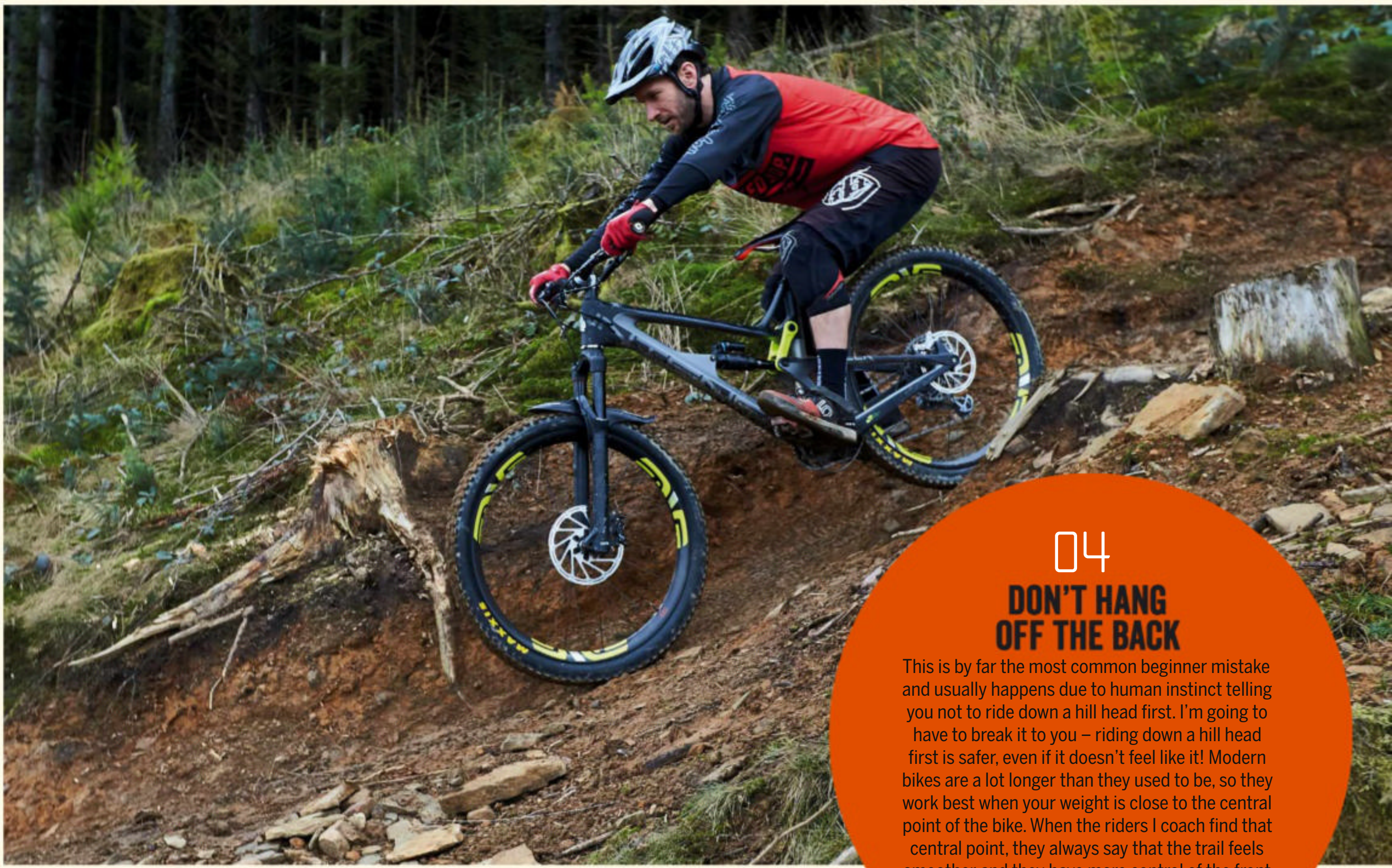
DON'T FOCUS ON YOUR FRONT WHEEL

As a new(ish) rider, it's common to stare at your front wheel, because you're not trusting what it's going to do. You're worried it might slide out, which is an understandable concern. Trust in the grip of your front tyre will develop naturally over time, but to speed that process up, practise keeping your focus on the section of trail coming up ahead. That way, things won't spring themselves on you so suddenly, and you'll be able to plan your line and where to use the brakes to slow down. Trust in your front wheel will also increase if you keep your body further forward and your arms bent. An improved body position will help to stop you from looking at the front wheel.

03

PUMP ROLLERS, DON'T JUMP THEM

Getting air off single rollers can be super fun, but as those who've tried it will know, the landing isn't always the most comfortable! As a beginner, if you're wanting to get some airtime, I'd advise practising on a tabletop jump instead of single rollers. Use the rollers as a chance to improve your squashing and pumping instead, so you can start to pick up speed and efficiency down the trail.



04

DON'T HANG OFF THE BACK

This is by far the most common beginner mistake and usually happens due to human instinct telling you not to ride down a hill head first. I'm going to have to break it to you – riding down a hill head first is safer, even if it doesn't feel like it! Modern bikes are a lot longer than they used to be, so they work best when your weight is close to the central point of the bike. When the riders I coach find that central point, they always say that the trail feels smoother and they have more control of the front wheel than when they hang off the back.

05

SLOW DOWN!

This one sits within the 'passion and drive' behaviour I mentioned earlier. Gritting your teeth and going for it is certainly one way to learn to ride bikes, but it has its limits. I'd advise slowing down and working hard to improve your technique, instead of just throwing yourself in at the deep end. When you go for a ride, try to keep a calm frame of mind, and you'll see how much easier riding becomes, as well as how much more time you have to anticipate and process what's coming next.

FIRST RIDE BASICS

New to mountain biking? Follow these pointers for maximum enjoyment and minimum stress

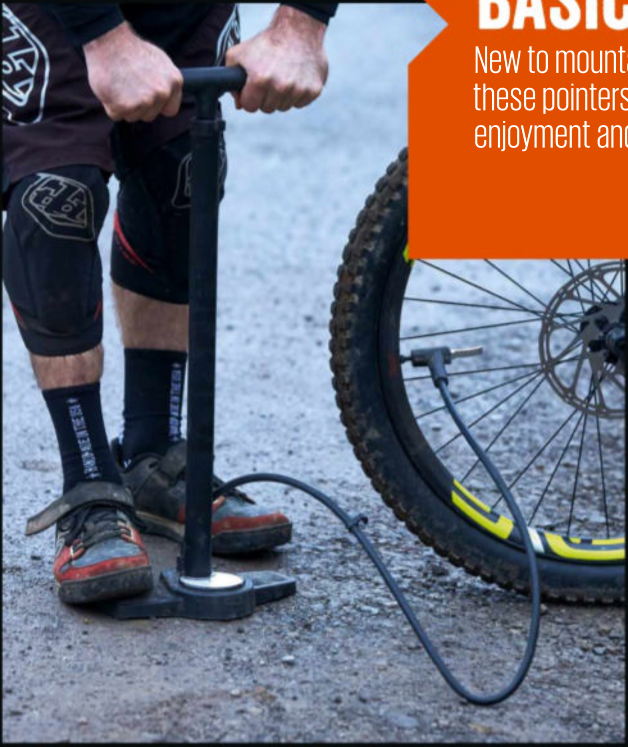
IS THIS TRAIL FOR YOU?

ROUTE PLAN

← Think about where you're going to ride. This allows you to prepare what you'll need to take, and ensures that the trail is right for you. Think about length and technicality – if you're new, you might not want to ride a 40km epic! Even if you're at a trail centre or bike park, it's worth noting that one centre's blue-graded descent may be more like another's red. Don't let that put you off – just make sure to ask other riders for advice if you're unsure.

PACK CORRECTLY

↓ Next, think about what you need to take with you. You shouldn't weigh yourself down with too much stuff, but it's important to take the essentials for the conditions you'll be riding in. Think, "Can I fix my bike? Tools. Do I have spares? Inner tube. Can I stay warm and dry? Jacket. What nutrition do I need? Water and snacks. What if someone falls off? Basic first aid kit." If you're riding in the rain, put your belongings in a watertight bag.



CHECK YOUR BIKE

↑ I've coached people who tell me their bike is fine, but I'll check their tyre pressures later and find they've only got 10psi in them. Basic checks before a ride can reduce the chances of a mechanical. It's worth running through a mental checklist: Tyres pumped up (25-30psi is a good base) and gears shifting smoothly, suspension at the correct sag, saddle at the right height and bolts torqued. Pay attention to pivots, as they can work loose.

PUSH THE RIGHT BUTTONS

→ Most modern bikes have various adjustments, so make sure things are set in the right 'mode' for what you're about to do. After you've completed a climb, your dropper seatpost (if you have one) will be up and your suspension could be locked out or in climb mode. Remember to drop that post and flick the lockout lever off, so your bike is working as it should on the descents and you can enjoy the ride back down.

READ THE TRAIL LIKE A PRO

Learn how to pick the best lines with coach **Olly Morris**

There are two main aspects of learning to ride well. One is technical – how you move your body to make the bike work properly for you. The other is how you read the trail. Being able to pick a good line and look, brake and accelerate in the right places will make you faster without even feeling like you're going quicker. Reading the trail can be tough to master, but once you do, everything seems easier and you find more flow. It's all about looking and thinking ahead. Whether you're familiar with the trail or not, there are four key considerations that'll help you plan how to tackle it and react in time, improving your riding no end – and upping the fun factor, too!

01

SELECTING LINES

Choosing the correct line isn't always easy – it's often not the most obvious one and there's frequently more than one option – but there are some key points to bear in mind. The first is to look for the smoothest line, because the bike will work better and you'll be more relaxed. Secondly, try to find a wide line so you can open up the corners and carry more speed. When riding at a popular venue, a golden rule is to search for options other than the main rut – that's where thousands of riders have ridden before, so it's usually full of braking bumps. When I ride, I enjoy seeking out a line that'll give me more flow. Also, try thinking about the line you're riding towards, rather than the one you're on.

PRACTICE TIP

PRACTISE YOUR PUMPING AND UNWEIGHTING AS THIS CAN BE A QUICKER WAY TO GET ONTO YOUR CHOSEN LINE, ESPECIALLY IF YOU NEED TO GET OVER AN OBSTACLE.

02

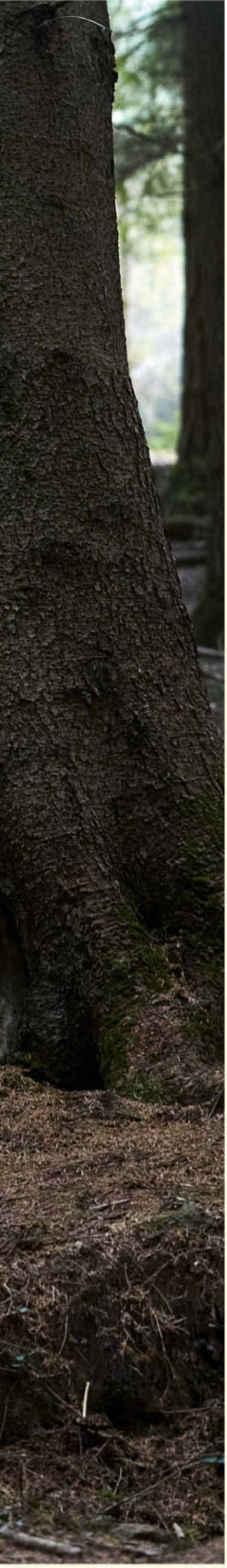
BRAKING POINTS

Arguably the most important part of reading a trail is judging where you need to brake. There's such a fine line between scrubbing off speed too late and stalling in the turn, and braking too early, making the corner no fun. So how do you choose your braking points? This is definitely something that improves with experience. Generally, I'd advise you to look for smoother parts of the trail – where there's more grip – to brake on, as the wheels will stick to the ground better, making braking more efficient.

+

PRACTICE TIP

REMEMBER TO MODULATE YOUR BRAKING ACCORDING TO THE SURFACE AND TRACTION AVAILABLE SO YOU DON'T LOCK UP YOUR WHEELS.



03
FOCAL POINTS

I'm sure you've heard the advice many times to 'look up'. But look up at what? To read a trail you need to use focal points along the track to give yourself something to look at. These points can be in different places to suit different riding styles, but will generally be the next place you'll change direction. Searching for these points of direction change will help with all aspects of reading the trail. The question is, when do you stop looking at one focal point and start looking for the next one? That depends entirely on the rider and the trail section, so experiment to find what works best for you.

PRACTICE TIP

FIND A CORNER WITH A CLEAR POINT WHERE YOU WANT TO CHANGE DIRECTION. PRACTISE RIDING INTO THE TURN STARING AT THIS FOCAL POINT AND EXPERIMENT WITH WHEN YOU LOOK AWAY TO THE EXIT OF THE CORNER, TO SEE WHAT TIMING YOU PREFER.

04
ACCELERATION POINTS

Finding places to help the bike accelerate is a slightly more advanced skill. It might be a matter of pre-hopping into the back of a stump or rock, or simply pumping down a slope on the trail. The acceleration point doesn't have to be smooth, it just has to be something you can pump the bike into to help generate more speed and flow. I love finding these points because it means you don't have to pedal as much to hold your speed, and it makes riding the trail more fun, too.

PRACTICE TIP

THE KEY SKILL TO PRACTISE HERE IS PUMPING, SO PLAY ABOUT WITH THE TIMING, SPEED AND FORCE OF YOUR PUMP DEPENDING ON THE FEATURE YOU'RE USING.

STAY ON TOP IN THE SLOP

Get the most out of winter riding with these tips from coach and guide **Emily Horridge**

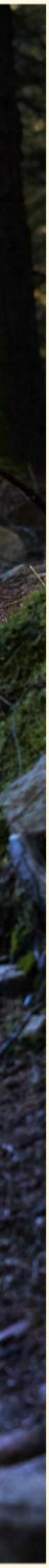
Ride with commitment. Of course, you'll probably want to just get a feel for the grip levels in the first section of trail, but once you've done that, start trying to commit to the ride. Stay loose on the bike, to allow it to move around underneath you. It's human nature to want to shuffle backwards when we're unsure of situations, and on the bike this translates into hanging off the back, with no control over the front wheel. Try to counter that by maintaining a good body position that puts you fully in charge of the bike. If this sounds scary to put into practice, then start by trying it on short sections of trail that look OK, and over time you'll build the confidence to do it on the gnarlier-looking bits.

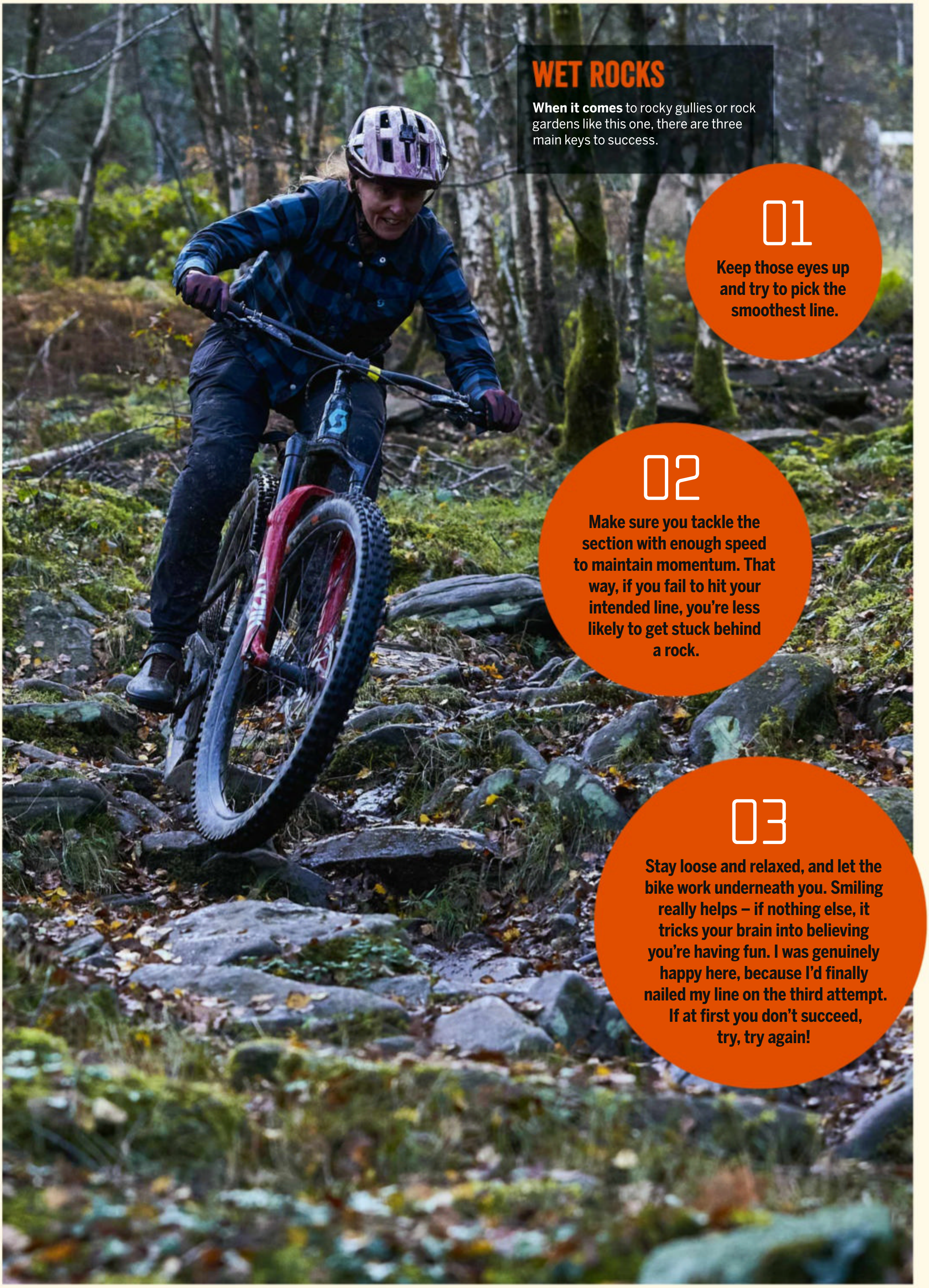
PRO-FILE

EMILY HORRIDGE

JOB Skills coach & trail guide

CREDENTIALS
Hailing from South West England, Emily now lives in the Alps, where she runs a skills coaching and MTB guiding company. Emily progressed through the national downhill ranks to race at the UCI World Cup series for many years and is now the reigning Masters world champion.





WET ROCKS

When it comes to rocky gullies or rock gardens like this one, there are three main keys to success.

01

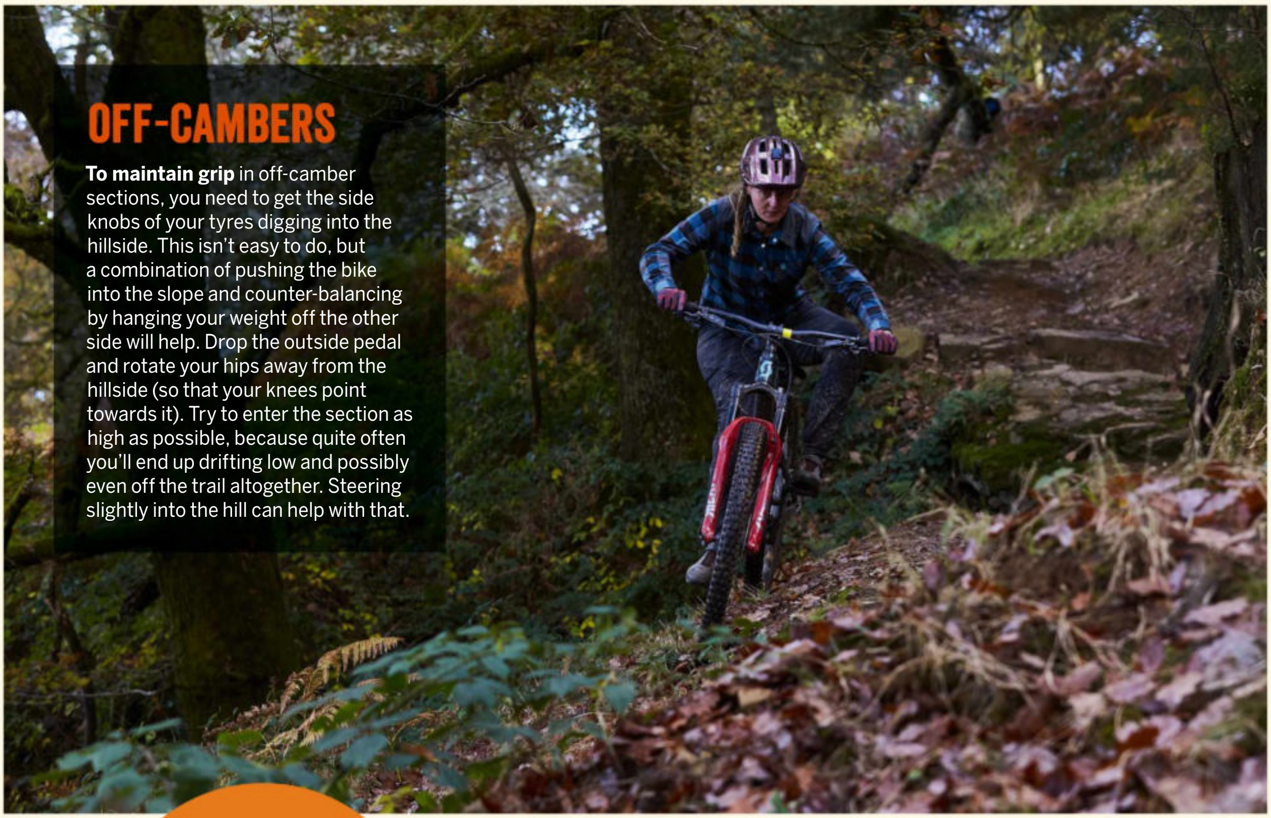
Keep those eyes up and try to pick the smoothest line.

02

Make sure you tackle the section with enough speed to maintain momentum. That way, if you fail to hit your intended line, you're less likely to get stuck behind a rock.

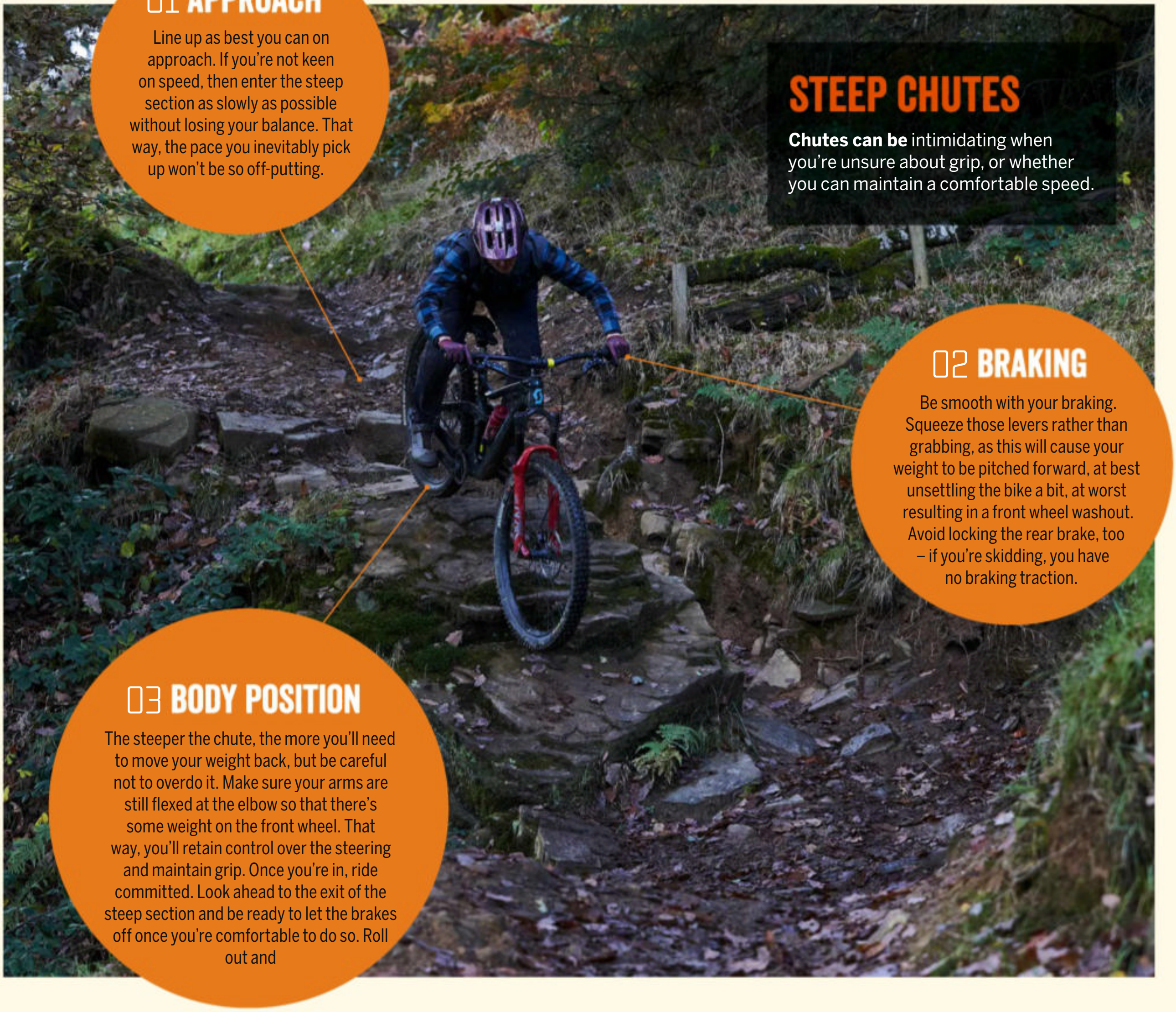
03

Stay loose and relaxed, and let the bike work underneath you. Smiling really helps – if nothing else, it tricks your brain into believing you're having fun. I was genuinely happy here, because I'd finally nailed my line on the third attempt. If at first you don't succeed, try, try again!



OFF-CAMBERS

To maintain grip in off-camber sections, you need to get the side knobs of your tyres digging into the hillside. This isn't easy to do, but a combination of pushing the bike into the slope and counter-balancing by hanging your weight off the other side will help. Drop the outside pedal and rotate your hips away from the hillside (so that your knees point towards it). Try to enter the section as high as possible, because quite often you'll end up drifting low and possibly even off the trail altogether. Steering slightly into the hill can help with that.



STEEP CHUTES

Chutes can be intimidating when you're unsure about grip, or whether you can maintain a comfortable speed.

01 APPROACH

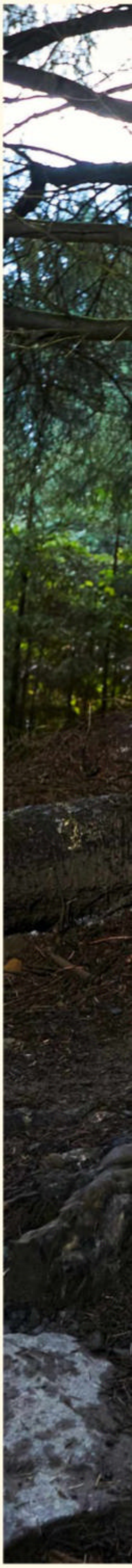
Line up as best you can on approach. If you're not keen on speed, then enter the steep section as slowly as possible without losing your balance. That way, the pace you inevitably pick up won't be so off-putting.

02 BRAKING

Be smooth with your braking. Squeeze those levers rather than grabbing, as this will cause your weight to be pitched forward, at best unsettling the bike a bit, at worst resulting in a front wheel washout. Avoid locking the rear brake, too – if you're skidding, you have no braking traction.

03 BODY POSITION

The steeper the chute, the more you'll need to move your weight back, but be careful not to overdo it. Make sure your arms are still flexed at the elbow so that there's some weight on the front wheel. That way, you'll retain control over the steering and maintain grip. Once you're in, ride committed. Look ahead to the exit of the steep section and be ready to let the brakes off once you're comfortable to do so. Roll out and



WET ROOTS

Think about your line choice. Here, I've chosen to tackle one big root instead of the smaller, more slippery-looking ones you can see to my left.

01

Brake before you reach the roots, and set up for the line you're going for. I'm taking an inside line around this slight corner, so you can see my body is set up to do that.

02

Spot your chosen line. Once on target, make sure you shift your gaze and look down the trail to see what's coming next.

03

Roll over the root, staying relaxed and allowing the bike to do its work. If you have to brake, pull smoothly on the levers. Avoid grabbing, as this can result in a sudden loss of grip.

04

Keep your eyes up and looking at the next section of trail. This will help keep you rolling and get you ready for what comes next. Smiling is optional, but I strongly recommend it!

PRO TIP

ROOTS TO SUCCESS

AVOID IT

If there's space, you can just ride around the outside of the roots. The roots on the inside of this corner are combined with deeper steps and awkward angles, so the outside line works really well. It's much smoother, allowing me to carry more speed.

BUNNYHOP

A bunnyhop is another great way to tackle roots. If your hop technique isn't strong, keep an eye open for little rocks or roots you could use to help propel you into the air – that's what I did here to clear the big roots at the base of the tree. If the roots have kindly grown directly across the trail, then you're in luck.

LOOK AHEAD

The best way to ride across roots is as close to perpendicular as you can. Make sure you're looking further down the trail for what comes next, as this will help keep you rolling and stop you getting fixated on any one root in particular.

CORNER WITH CONFIDENCE

Rail turns like a pro with top slopestyler **Tom Isted**

Cornering is one of the most important and rewarding aspects of mountain biking, whether you're a speed-hungry racer, a thrill-seeking freerider or a beginner just starting out on your MTB journey. There are many types of corners, including grassy off-camber turns, narrow rocky gullies, steep greasy ruts and root-infested gnar. But some of the most rewarding ones to nail perfectly are the 'berms' (banked turns) you'll find at bike parks and trail centres, and, at the other end of the scale, the less supportive corners you're likely to encounter on more natural trails. So, we've asked pro MTBer Tom Isted to share his top tips for railing berms and flat turns.

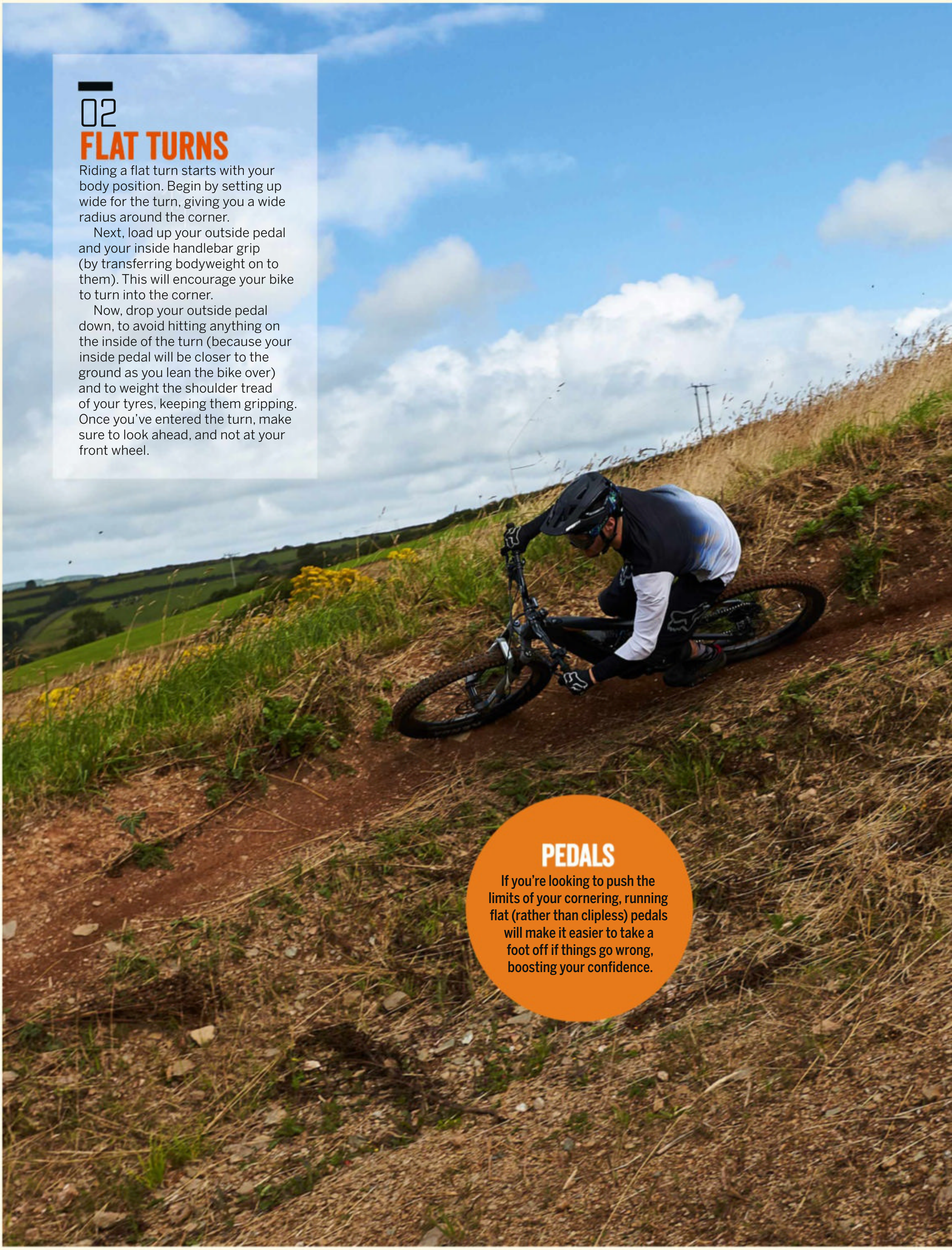
01 BERMS

Begin by setting yourself up wide before the berm, giving you a good angle of attack as you ride into the banking.

Next, consider your body position. Make sure your weight is central on the bike. Too far over the back, and your front wheel will become light and climb the berm – you don't want to run wide and go over the top! Conversely, if your weight is too far forward, your bike will oversteer in turns (although this is great when you're playing around and want to pull cutties – sliding the rear wheel deliberately).

As you enter the berm, try to keep your bike on a constant radius – ie. don't let it wander up or down the face. This will help you maintain control and prevent you from scrubbing off speed.

Once you're halfway round, make sure to look ahead and not at your front wheel. This will help your body position, because the bike will tend to go where you're looking, and will also ensure you know what's coming up further down the trail.



02

FLAT TURNS

Riding a flat turn starts with your body position. Begin by setting up wide for the turn, giving you a wide radius around the corner.

Next, load up your outside pedal and your inside handlebar grip (by transferring bodyweight on to them). This will encourage your bike to turn into the corner.

Now, drop your outside pedal down, to avoid hitting anything on the inside of the turn (because your inside pedal will be closer to the ground as you lean the bike over) and to weight the shoulder tread of your tyres, keeping them gripping. Once you've entered the turn, make sure to look ahead, and not at your front wheel.

PEDALS

If you're looking to push the limits of your cornering, running flat (rather than clipless) pedals will make it easier to take a foot off if things go wrong, boosting your confidence.

SUSPENSION

Predictable handling and maximum grip is the key here, so check your suspension is working properly and set up to suit your weight and riding style – the manufacturer's recommended settings are a good starting point.

FREERIDE TURNS

Berms aren't only found at bike parks and trail centres, but also on jump lines and slopestyle courses. The basic technique remains the same, but the focus is on generating speed, to get through the next feature. To do this, you need to pump. After the halfway point of the berm, the bike will begin travelling down the face. At this point, generate speed by extending your arms and then legs, pushing the bike into the ground as you exit the turn.

TYRE PRESSURES

As you're loading the bike up with g-force in the turns, you need it to handle consistently, so check your pressures. Most riders run a couple more psi in the rear tyre than up front, because it supports more of your weight, on flatter trails. More pressure means more stability and less rolling resistance, but less grip (and vice versa).

WHERE TO PRACTISE

A bike park or purpose-built trail centre track is the perfect place to hone your cornering skills. Here, Tom is railing the turns at **Woody's Bike Park** in Cornwall, where you'll find wide, flowing jump tracks full of berms, graded from blue to double black, to help you progress.

HOW TO...

GET FAST FOR FREE!

Tips for boosting your skills, fun and fitness without emptying your wallet

VARY YOUR RIDING SPOTS

Variety is the spice of life. If your local trails are sandy, have a look for somewhere rocky. If you usually ride jumps, try to spend time on some techy gnar. OS Maps, Google Maps and Strava are all useful resources to find and explore new trails on your doorstep. Being able to tackle different types of terrain boosts your skills and makes you a more adaptable rider.

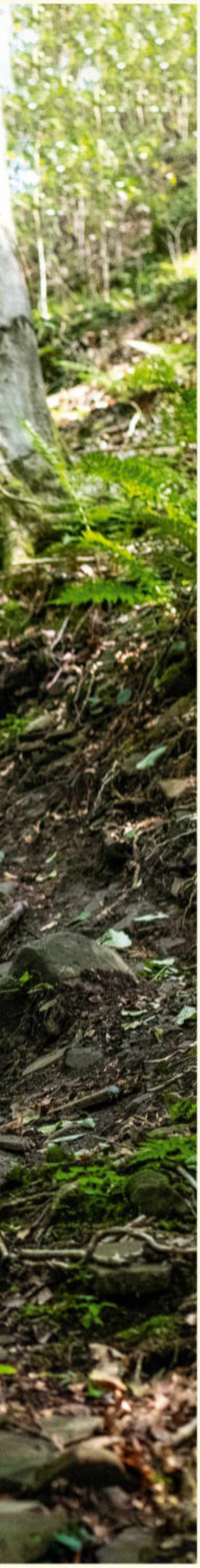
1 TAKE TIME TO SECTION & SESSION

Before bike parks offered quick and easy uplift services, it was common for riders to 'session' a single section of trail, repeating the same sequence of obstacles again and again, then pushing their bike up alongside the track they'd just descended.

The reason for sessioning a trail section is twofold. Firstly, it enables you to analyse your line choice. And secondly, practice makes perfect! By riding the same piece of trail repeatedly, you'll eventually find that you progress from 'just riding down it' to attacking it with purpose and aiming for perfection.

Having the feeling of 'I know this bit' creates confidence, which allows your body and mind to relax, and gives you the headspace to consider how best to ride the section. You'll begin to become aware of possible improvements, in terms of how you're moving on the bike, which lines to choose and where to brake. For example, you might realise that if you scrub off most of your speed before the section and then take a high, off-camber line, it'll set you up better for the next turn, making you quicker overall.

For downhill and cross-country racing, this skill can help you spot possible lines quickly and let you spend your precious on-track time at events more efficiently. The best enduro riders can analyse these possibilities and choose their optimal line on the fly, on a track they've never even seen before!



MONEY-SAVING TIPS

RIDE LOCALLY
Paying to ride at bike parks or park at trail centres adds up. There are amazing tracks all over the UK that you can ride for free, and they're so varied it'll make you a better rider, too.

DO SHUTTLE RUNS
If you're lucky enough to know of a venue with a road from top to bottom, do your own uplift! Get more riding done and share the fuel costs.

FORGET THE ALPS & PLAN A UK BREAK
We love riding abroad but there are top trails right here in Blighty. Pack a tent, hit the road and live the bike bum life.

BUY SECOND-HAND
It's possible to source good quality kit second-hand. Just be careful not to buy worn-out parts or get scammed.

PRIORITISE UPGRADES
Don't blow your budget on fancy bits because they look bling. Prioritise stuff that makes your bike faster, such as good tyres. Replace worn parts promptly to prevent damage.

2 IMPROVE YOUR LINE CHOICE

Just three inches to one side or the other can mean the difference between a smooth corner entry and a bucking-bronco ride ending in a puncture. Choosing the perfect line is a black art, affected by many factors, including your height, what bike you ride, your skill level and your riding style. That said, it's certainly something that can be learned. The best way to improve your line choice is to choose a piece of trail and visualise possible ways to tackle it. Over that rock? Smooth but longer left-hand line? Rough but more direct right-hand line? Try them all and decide which feels fastest! If possible, time yourself using an action cam or have a friend with a stopwatch record you through a segment.

3 RIDE WITH A BUDDY

Riding with a friend can give you extra motivation to push yourself. Whether you're trying to out-pedal a fit buddy on the climbs or keep up with a faster mate on the descents, it's a surefire way to progress. If you don't have friends who ride bikes, joining a local club or using social media to find like-minded mountain bikers is a great way to meet enthusiastic riding buddies. Observe how your riding partner tackles trail obstacles. Try to find sections where they do something differently to you. If you spot good technique like assertive body positioning or looking ahead down the trail, point it out to them. Have a go at mirroring their best techniques. Don't be afraid to ask questions – they'll usually be happy to help you. Remember that you have lots to offer them, too. A kind word of encouragement or constructive criticism can go a long way to making a rider faster and/or safer! Scope out trails together and discuss line choice. Ask your buddy to watch your technique and offer their opinion. Two heads are better than one!

EAT A BETTER DIET

Eating healthily isn't technically free, but swapping those pasties for smoothies won't break the bank, and cutting down on the takeaways and beer might even save you money. Make sure you drink enough water, too – staying properly hydrated can improve concentration, whereas being dehydrated is detrimental to overall health. You are what you eat, and improving your diet can quickly make you feel more energetic and boost your stamina.

PRO-FILE

ALAN MILWAY

JOB Performance coach

CREDENTIALS
Alan Milway has more than 13 years of experience training some of the world's best racers. He's also part of the holistic coaching brand +3 MTB, so while he has the knowledge to train those operating at the highest level, he understands the needs of everyday riders, too.

5 BOOST YOUR FITNESS

Improving your fitness will not only make you faster, but also mean you can ride for longer and feel less fatigued. Extra strength could help you avoid crashing, because you're more likely to successfully keep control of your bike. Increased mobility will mean that if you do hit the deck, you're less likely to suffer injuries brought on by tight muscles and inarticulate joints. Looking after yourself properly will mean fewer aches and pains, which improves wellbeing and can enable a more relaxed body position on the bike.

We asked coach-to-the-stars Alan Milway to give us his cost-free tips on improving health and fitness:
"Improving your fitness has a very positive impact on your riding. Climbs are more enjoyable, you can complete a longer route without exhaustion and, to top it off, you can have that turn of speed to keep up with or pull away from your buddies.

"The first key thing to do is to establish a routine. Start with perhaps just one evening for a midweek ride. This will have a positive benefit to your health and to your enjoyment of the weekend ride.

"Mobility is an area that's often overlooked, but if you lack it, the effects are often noticed during a ride, or in the following days when it'll cause soreness and pain.

"Greater strength equals more control. When the going gets rougher and faster, staying in the correct position on the bike and not getting fatigued is vital."

4 IMPROVE YOUR BIKE SET-UP

It's not what you've got, it's how you use it. Whatever bike you have, it's important that it fits well and works properly. We recommend getting your set-up dialled-in by an expert, but here are a few ideas to get you started. These things can be done by trial-and-error, it just takes time and effort. Change one thing at a time, then go for a ride and see if there's any improvement.

01

SUSPENSION

Stick to the manufacturer's recommended sag settings. Aim for 20-25 per cent front and 25-30 per cent rear (on a full-sus). With these settings, if you're bottoming-out, you need to add volume spacers (for air-sprung suspension) and/or increase compression damping. If your fork or shock returns slowly, reduce the rebound damping. And if it's tiring to ride, increase the rebound damping. A harsh feeling over bumps might mean the compression damping is too firm.

02

BAR WIDTH

Don't be afraid to cut down your handlebar slightly if you think it's too wide. If you feel like you're collapsing onto the bar or it's difficult to shift your weight back, those are telltale signs that a narrower width might suit you better. A 5ft 1in rider shouldn't be using an 800mm bar unless they have extremely long arms or are on a Harley.

03

BAR HEIGHT

This controls how much weight you have on the front wheel, with more weight equalling more grip. But be aware that if your bar is too low, your arms will get tired and you're at risk of going over-the-bars. Too high and the bike will feel vague and wandery when exiting corners and you'll run wide. Take Allen keys on a ride and try swapping some stem spacers to see how it feels.

04

BUY THE RIGHT SIZE FRAME

OK, buying a bike is anything but free, but all frame sizes cost the same, so make sure you buy the correct one in the first place. In general, bikes are getting longer, lower and slacker, so if you're buying an older, pre-owned one, you may want to size up. As a general rule, a roomier cockpit makes a bike more stable and easier to ride, while a short reach figure makes for a more 'flickable' feel but can also be more tiring. If you're buying new, ask the advice of your local bike shop.

05

SADDLE ANGLE

Seat tube angles have been steadily steepening over the past few years, to put the rider in a more central position when climbing. You can't change your bike's seat tube, but you can mimic a steeper angle by shifting the saddle further forward than what looks 'right' and dipping its nose. This will help keep the front wheel down on the ascents. Having the seat too far back can lead to knee pain, so if you have this issue, mark where your saddle sits, then move it forward and dip the nose, and see if that helps.

06

TYRE PRESSURE

Just a few psi can make a huge difference to the way a bike handles. Correct pressure is a balancing act; more means the bike rolls faster, less means more grip. Insufficient pressure can cause the tyre to roll off the rim and increases the risk of punctures. Most riders run 10-20 per cent lower pressure in the front tyre than the rear, as there's slightly more weight over the back wheel.

KEY POINTS

SOME TIPS FOR ADDING THESE ELEMENTS INTO YOUR WEEK FOR FREE

Write down when you plan to ride (even just one evening a week) and invite a mate. This will establish commitment

Long and steady is often more effective than very hard and very short, especially for those who aren't in a regular training programme. Time a route and try to match it over the weeks. This sets expectations and pacing for the ride

Mobility is important. You can do an effective all-body stretch by following a 10-minute YouTube video

Don't overlook the most basic strength exercises. Push-ups, planks and chin-ups will improve your upper body with no outlay

TRY DIFFERENT TYPES OF RIDING

A spot of cross-country will improve your fitness and climbing. If you're a wheels-on-the-ground type rider, find some tabletop jumps to practise on. And if you've never ridden trials, turn a flat area into a skills course, marking out a route to navigate without putting your foot down, then adding 3D features such as logs or pallets. XC riders will be well-served by riding some downhill runs or sessioning some turns. Bikepacking is a great way to boost endurance, and you don't need expensive gear – a backpack with food, basic tools, sunscreen and a waterproof is enough for a day trip.

6 CATCH IT ON CAMERA

A picture is worth a thousand words, so maybe a video is worth a million! Record a section or jump with your phone, or ask a friend to film you. Watch the video back and try to spot areas for improvement, such as body position or technique. Using slo-mo is a great way to spot subtleties that are difficult to see with the human eye. For best results, review the footage while out on the trail, so that you can analyse your riding and implement changes in real time.

7 GET INTO GOOD HABITS

RIDE MORE

The more time you spend on your bike, the fitter you'll get, and you'll also get more used to manoeuvring it around. Perhaps you could fit in an extra mountain bike ride during the week? Or could you boost your saddle time by commuting to work by bike? That way, you'd save that fuel/bus/train money, and improve your fitness and bike handling at the same time. If you have an indoor trainer, this winter could be the time to blow the dust off it and work on that fitness! But remember that bike time isn't just about getting in shape. Regularly having your feet on the pedals and the grips in your hands will also increase your confidence and skill on the bike. Whether you're just hopping around on the kerbs outside your house, heading out on a ride with your family or off on a quick spin down to the shops, being astride your MTB can passively boost your skill levels.

TEACH YOURSELF

You'll find some great skills advice in *MBUK* (OK, you do have to buy the mag, but hopefully you'd be doing that anyway) and free online. From in-depth tutorials on *BikeRadar* and YouTube to brief Instagram reels, watching qualified coaches impart their wisdom can be really helpful. The all-important step is then trying out what you've learned during your next ride. Don't be dismayed if you don't get it right straight away – practice makes perfect.

LINK TURNS LIKE A BOSS

Brake, set up, rail, repeat to nail consecutive corners

Carrying speed through interlinking switchbacks is all about thinking ahead and doing things at the right point. Going balls-to-the-wall into the first corner may feel fast, but it'll most likely unsettle you and cause you to mess up the next one. Follow these tips and you'll soon be linking your turns like an Olympic skier!

01

READ THE TRAIL

You may not be able to see around the turn, but think about what the trail has been like so far. Anticipate how much grip you think the dirt will have and how supportive a camber there'll be. Brake accordingly, before you drop into the turn, and let off as you enter it. Braking mid-turn will stand the bike up and slow you right down, so try to stick to your braking points.

02

SET UP WIDE

If there's space, position yourself at the outside edge of the trail, to widen the arc and make it easier to rail around. That said, if the outside line looks unsupportive or blown out, then think about setting up wide and cutting inside. Drop a foot if needed, and roost up some dirt, emulating the king of inside lines, Sam Hill.

03

LEAN AND LOOK

Once you've initiated the turn, look at where you want your wheels to end up, not just at the exit of the corner. This will ensure you don't understeer. In berms, stay in a neutral position, on top of the bike. If the turns are flatter and drifty, then use your arms to lean the bike between your legs to maintain traction. As you exit, your eyes should already be focused on the next corner.

04

SCANDI FLICK

For very tight corners, you can grab a big handful of brake to put the bike into an opposite lock. The tyres will stop sliding and bite as you release the lever, and this should catapult you the other way into a perfect arc – but it takes practice!

RIP ROCKS & SURF SCREE

Loose rocky terrain can feel unsettling and sketchy – we show you how to tame it

Head out to the hills on the hunt for natural descents and you're almost guaranteed to come across loose, rocky terrain. When the ground starts sliding around under your wheels, it's easy to get out of shape, lose control and crash – and crashing on this stuff hurts! Follow these tips, though, and you'll be skipping across shifting rocks with unfaltering composure.

01

STAY LOOSE

It's the key to riding confidently in many situations, but it's never truer than here. If you're calm and relaxed, then the bike is free to move around beneath you. If you stiffen up, then whenever the bike is deflected, the force will be transmitted straight through to you, knocking you off-balance.

02

CARRY SOME MOMENTUM

We're not saying you should barrel headlong into sections with reckless abandon, but you'll find that a little more speed will help your wheels to surf over the rocks, rather than getting hung up in the holes between them.

03

HEAD UP, EYES UP

We're all guilty of this to some degree – looking at the front wheel and not at what's coming up. When you're attacking high-speed, rocky straights, you want to consciously look further forward, so you can spot your line. Look for the path of least resistance – often where there's water flowing.

04

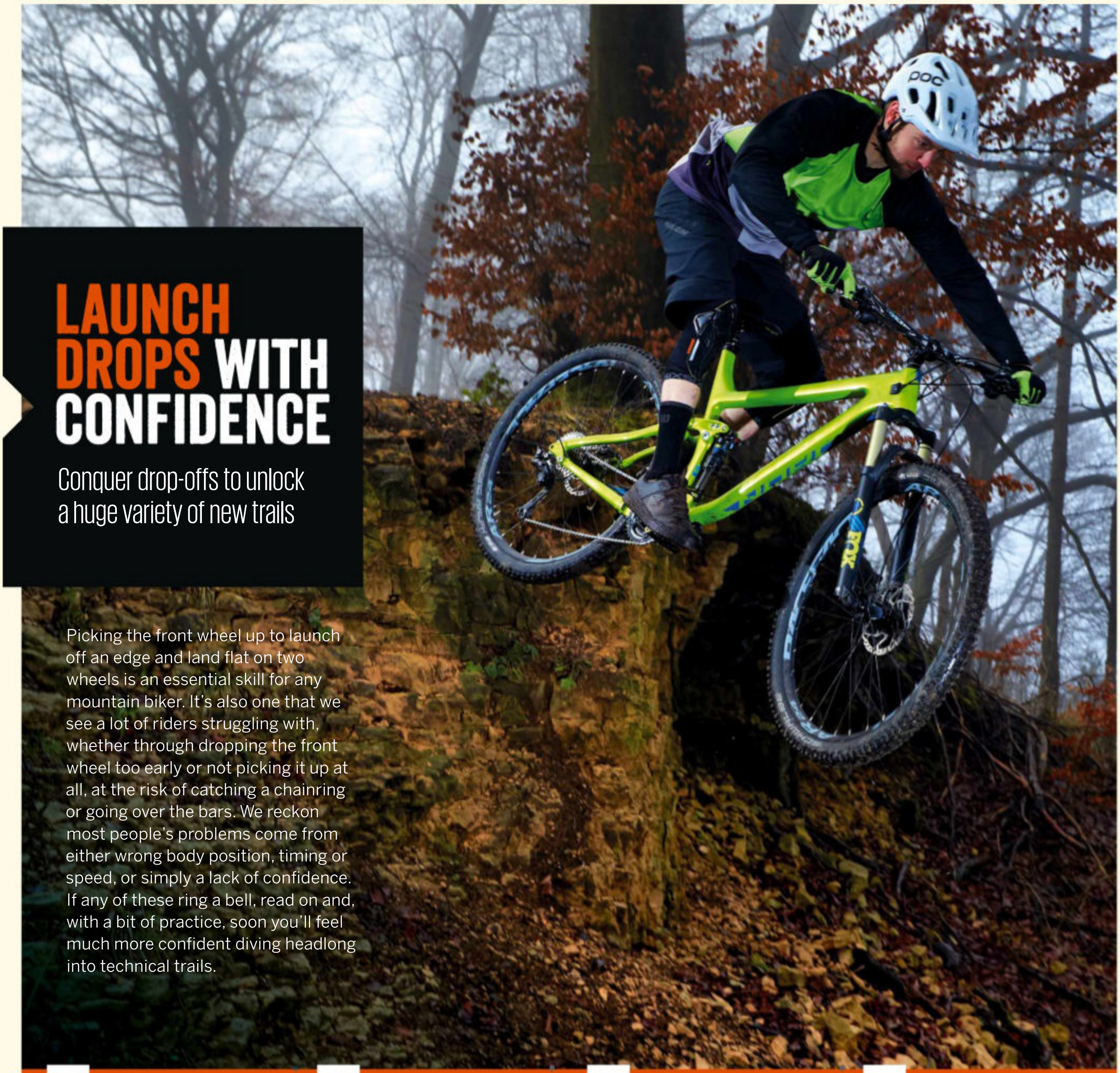
EASY ON THE BRAKES

Set up early and do your turning and braking on more solid ground. If you do have to brake mid-section, be gentle and feather the levers. Control your speed when the bike's straight and upright, otherwise it can disappear from under you in an instant.

05

DROP A FOOT FOR BALANCE

When the ground is loose and uneven, trying to keep traction and corner with your feet up is unpredictable at best. Sometimes the best way is to grab a handful of back brake, drop a foot and slide your wheels through the scree. It's always fun and is sometimes the fastest and safest way too!



LAUNCH DROPS WITH CONFIDENCE

Conquer drop-offs to unlock a huge variety of new trails

Picking the front wheel up to launch off an edge and land flat on two wheels is an essential skill for any mountain biker. It's also one that we see a lot of riders struggling with, whether through dropping the front wheel too early or not picking it up at all, at the risk of catching a chainring or going over the bars. We reckon most people's problems come from either wrong body position, timing or speed, or simply a lack of confidence. If any of these ring a bell, read on and, with a bit of practice, soon you'll feel much more confident diving headlong into technical trails.

01

TIMING

The two key elements to riding a drop-off are driving your feet forward through the pedals and shifting your weight back, in order to make the bar go light and so lift the front wheel. These must be done as one simultaneous movement as you reach the lip of the drop. Too early and you're likely to drop the front wheel before the back wheel has cleared the lip. If you just try to pull up on the bar without changing your body position, you'll struggle to lift the front wheel.

02

FIRST STEPS

Playing in the street might sound a bit juvenile, but a kerb or small step is definitely the best place to learn drops. The definite edge gives you a clear cue for when to initiate the movement, but the height isn't so big that if you don't manage it you'll clip your chainring. Get the basics dialled here and then start increasing the size of the drops to build confidence.

03

SPEED IS YOUR FRIEND

Well, relatively speaking – you need to approach the drop with enough speed to easily generate the upward momentum required. Creeping off the edge too slowly means you'll have to really yank back on the bar or add a pedal stroke to lift the front wheel, and makes side-to-side balance harder too. Similarly, don't go in flat out, as your speed and trajectory will do the work for you and you won't learn the proper technique.

04

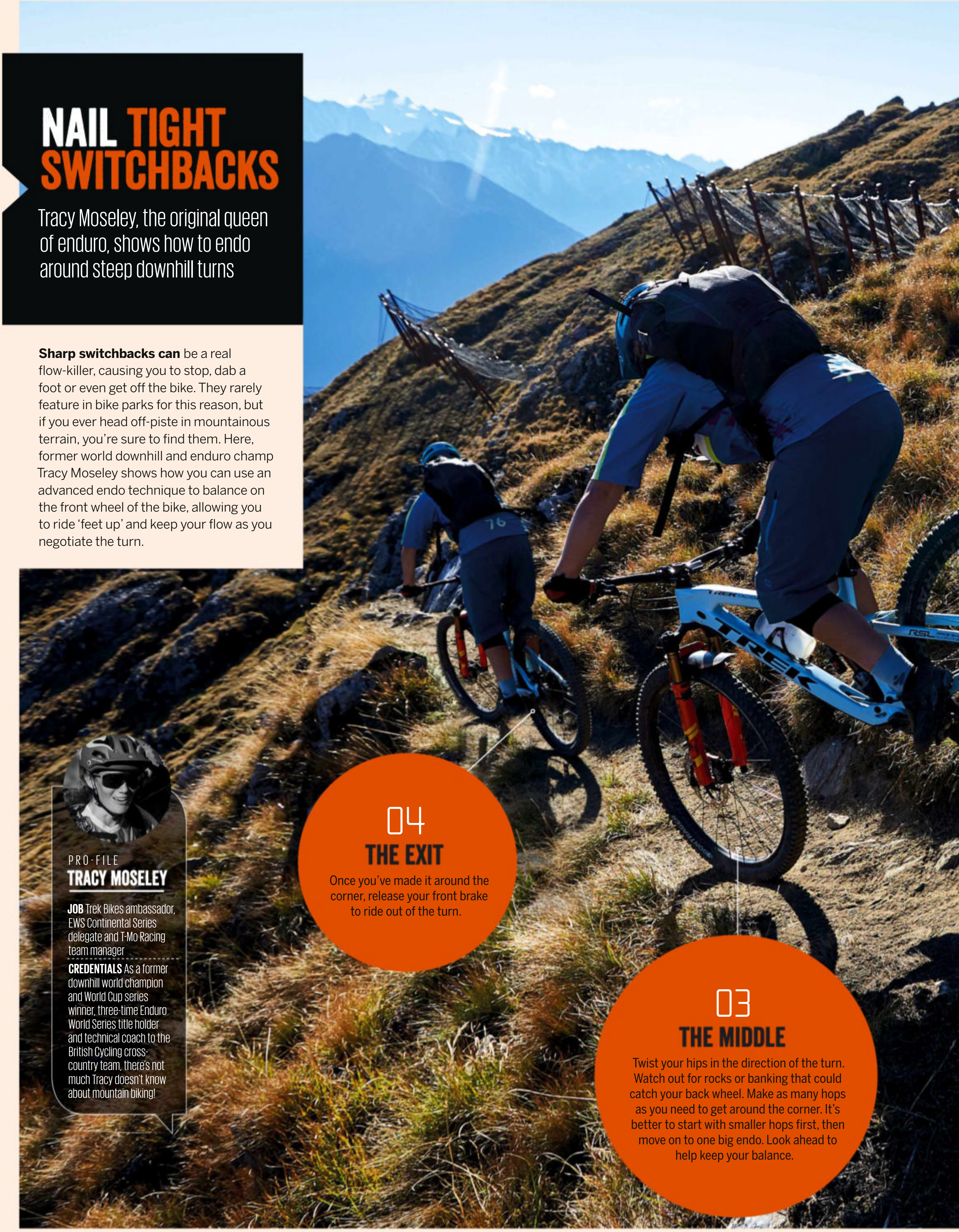
FASTER AND BIGGER

Whether you're plopping off a kerb or sending a cliff at Red Bull Rampage, the principles stay the same. Once the mechanics become second nature, you can concentrate on spotting your landing. Going at full speed into a drop that doesn't have a gap (ie. not a step-down), you'll find you actually need to push down on the bars a little to 'scrub' the drop so your bike meets the landing earlier, rather than thinking about lifting the wheel up as you would when learning.

NAIL TIGHT SWITCHBACKS

Tracy Moseley, the original queen of enduro, shows how to endo around steep downhill turns

Sharp switchbacks can be a real flow-killer, causing you to stop, dab a foot or even get off the bike. They rarely feature in bike parks for this reason, but if you ever head off-piste in mountainous terrain, you're sure to find them. Here, former world downhill and enduro champ Tracy Moseley shows how you can use an advanced endo technique to balance on the front wheel of the bike, allowing you to ride 'feet up' and keep your flow as you negotiate the turn.



PRO-FILE

TRACY MOSELEY

JOB Trek Bikes ambassador, EWS Continental Series delegate and T-Mo Racing team manager

CREDENTIALS As a former downhill world champion and World Cup series winner, three-time Enduro World Series title holder and technical coach to the British Cycling cross-country team, there's not much Tracy doesn't know about mountain biking!

04

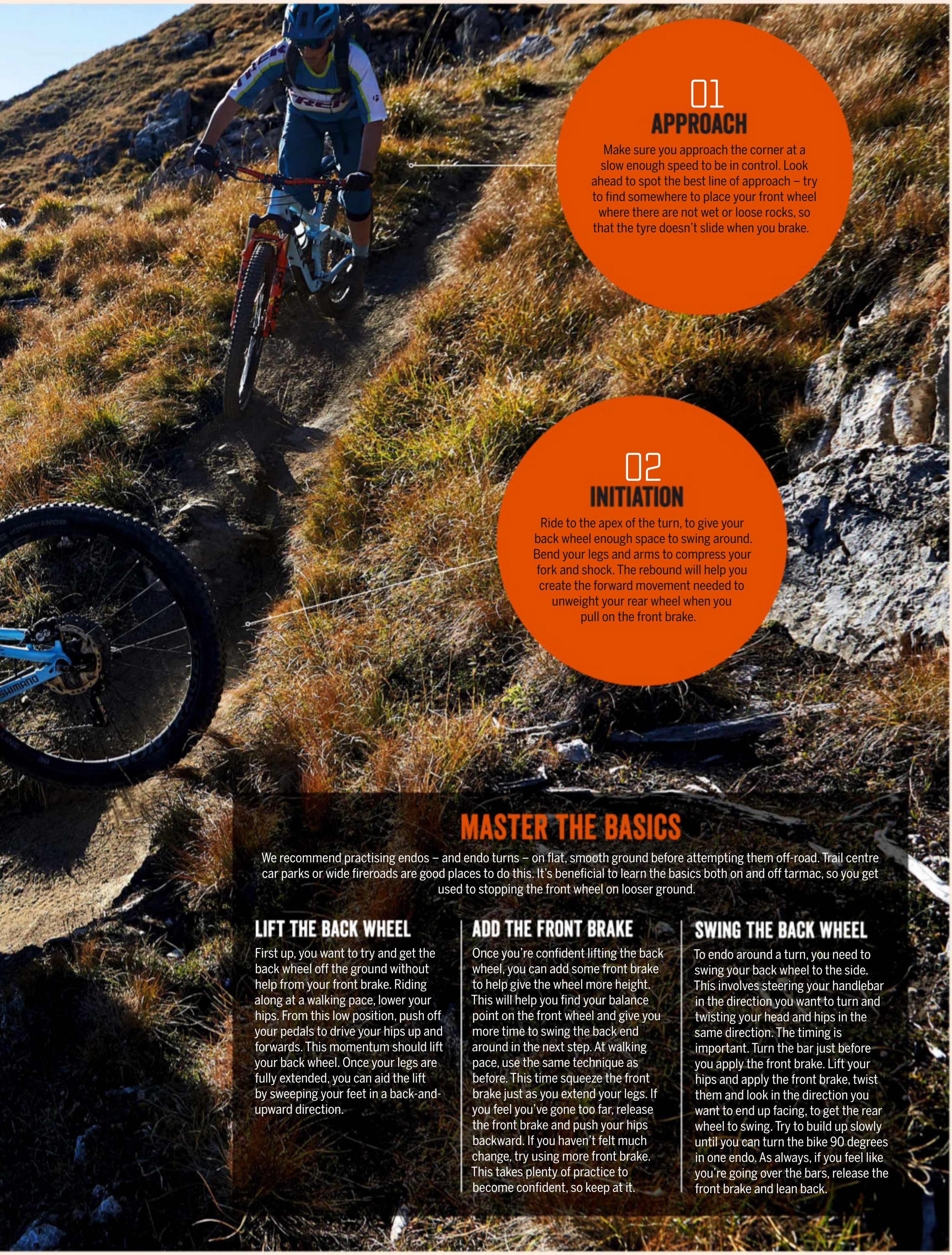
THE EXIT

Once you've made it around the corner, release your front brake to ride out of the turn.

03

THE MIDDLE

Twist your hips in the direction of the turn. Watch out for rocks or banking that could catch your back wheel. Make as many hops as you need to get around the corner. It's better to start with smaller hops first, then move on to one big endo. Look ahead to help keep your balance.



01

APPROACH

Make sure you approach the corner at a slow enough speed to be in control. Look ahead to spot the best line of approach – try to find somewhere to place your front wheel where there are not wet or loose rocks, so that the tyre doesn't slide when you brake.

02

INITIATION

Ride to the apex of the turn, to give your back wheel enough space to swing around. Bend your legs and arms to compress your fork and shock. The rebound will help you create the forward movement needed to unweight your rear wheel when you pull on the front brake.

MASTER THE BASICS

We recommend practising endos – and endo turns – on flat, smooth ground before attempting them off-road. Trail centre car parks or wide fireroads are good places to do this. It's beneficial to learn the basics both on and off tarmac, so you get used to stopping the front wheel on looser ground.

LIFT THE BACK WHEEL

First up, you want to try and get the back wheel off the ground without help from your front brake. Riding along at a walking pace, lower your hips. From this low position, push off your pedals to drive your hips up and forwards. This momentum should lift your back wheel. Once your legs are fully extended, you can aid the lift by sweeping your feet in a back-and-upward direction.

ADD THE FRONT BRAKE

Once you're confident lifting the back wheel, you can add some front brake to help give the wheel more height. This will help you find your balance point on the front wheel and give you more time to swing the back end around in the next step. At walking pace, use the same technique as before. This time squeeze the front brake just as you extend your legs. If you feel you've gone too far, release the front brake and push your hips backward. If you haven't felt much change, try using more front brake. This takes plenty of practice to become confident, so keep at it.

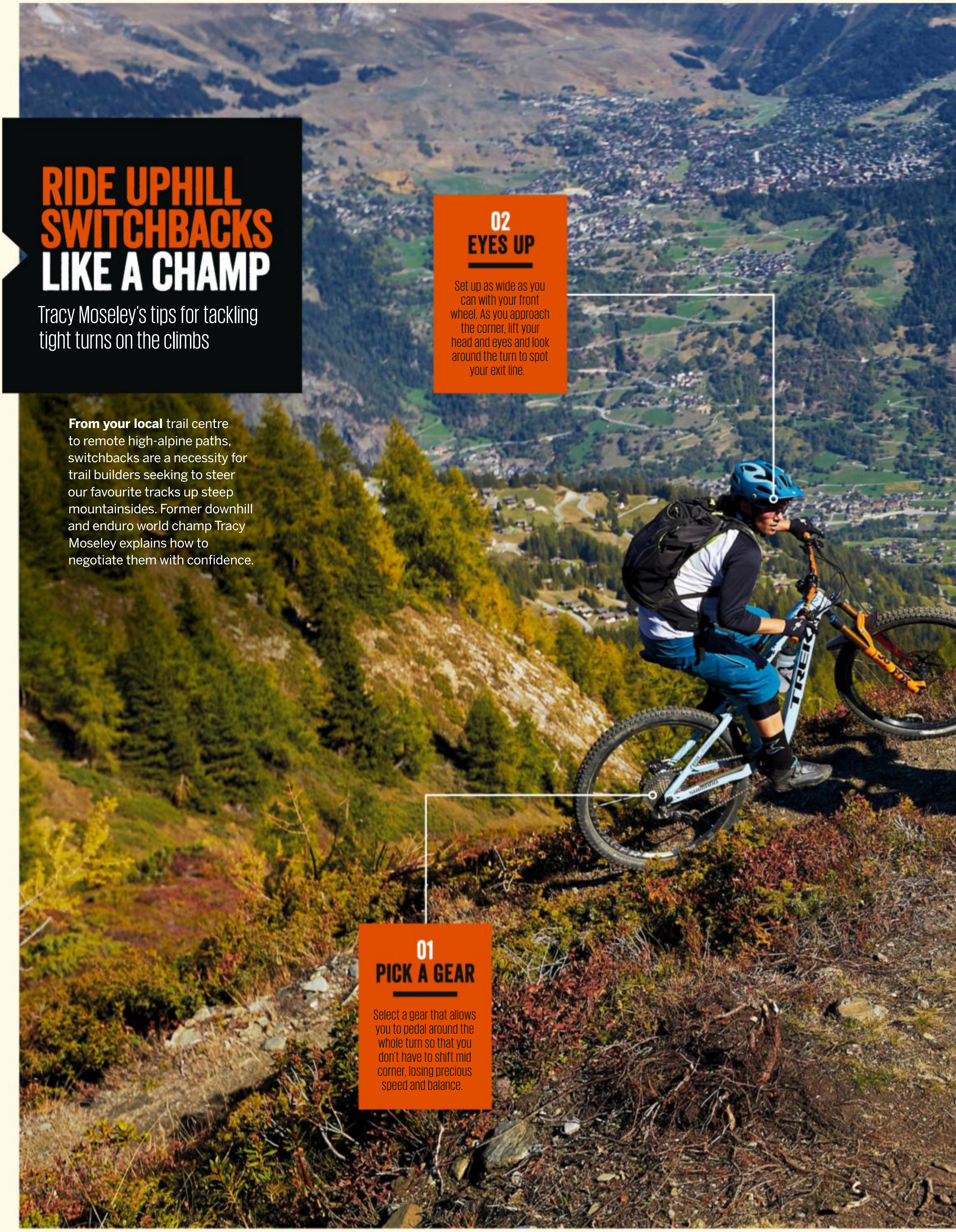
SWING THE BACK WHEEL

To endo around a turn, you need to swing your back wheel to the side. This involves steering your handlebar in the direction you want to turn and twisting your head and hips in the same direction. The timing is important. Turn the bar just before you apply the front brake. Lift your hips and apply the front brake, twist them and look in the direction you want to end up facing, to get the rear wheel to swing. Try to build up slowly until you can turn the bike 90 degrees in one endo. As always, if you feel like you're going over the bars, release the front brake and lean back.

RIDE UPHILL SWITCHBACKS LIKE A CHAMP

Tracy Moseley's tips for tackling tight turns on the climbs

From your local trail centre to remote high-alpine paths, switchbacks are a necessity for trail builders seeking to steer our favourite tracks up steep mountainsides. Former downhill and enduro world champ Tracy Moseley explains how to negotiate them with confidence.

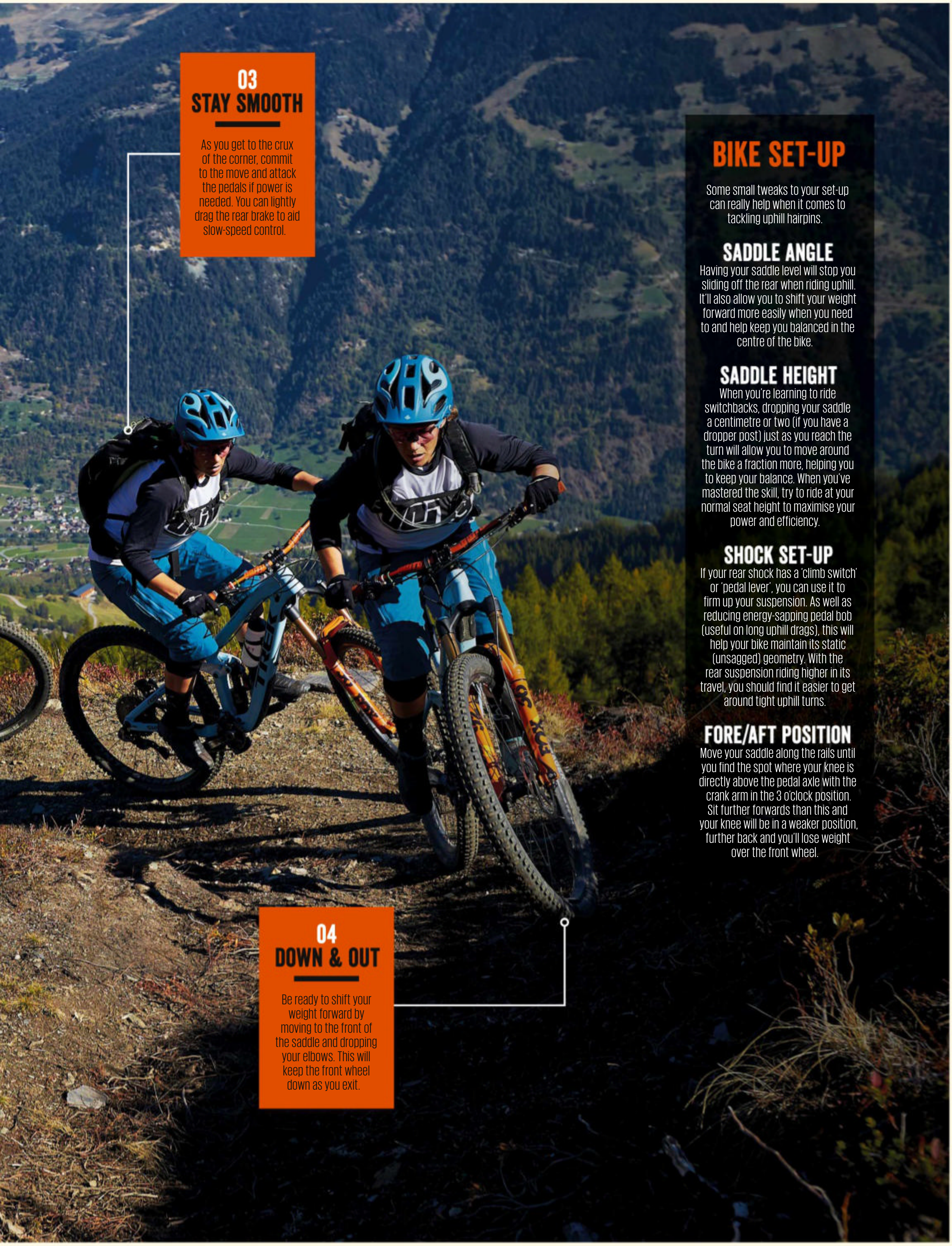


01
PICK A GEAR

Select a gear that allows you to pedal around the whole turn so that you don't have to shift mid corner, losing precious speed and balance.

02
EYES UP

Set up as wide as you can with your front wheel. As you approach the corner, lift your head and eyes and look around the turn to spot your exit line.



03
STAY SMOOTH

As you get to the crux of the corner, commit to the move and attack the pedals if power is needed. You can lightly drag the rear brake to aid slow-speed control.

04
DOWN & OUT

Be ready to shift your weight forward by moving to the front of the saddle and dropping your elbows. This will keep the front wheel down as you exit.

BIKE SET-UP

Some small tweaks to your set-up can really help when it comes to tackling uphill hairpins.

SADDLE ANGLE

Having your saddle level will stop you sliding off the rear when riding uphill. It'll also allow you to shift your weight forward more easily when you need to and help keep you balanced in the centre of the bike.

SADDLE HEIGHT

When you're learning to ride switchbacks, dropping your saddle a centimetre or two (if you have a dropper post) just as you reach the turn will allow you to move around the bike a fraction more, helping you to keep your balance. When you've mastered the skill, try to ride at your normal seat height to maximise your power and efficiency.

SHOCK SET-UP

If your rear shock has a 'climb switch' or 'pedal lever', you can use it to firm up your suspension. As well as reducing energy-sapping pedal bob (useful on long uphill drags), this will help your bike maintain its static (unsagged) geometry. With the rear suspension riding higher in its travel, you should find it easier to get around tight uphill turns.

FORE/AFT POSITION

Move your saddle along the rails until you find the spot where your knee is directly above the pedal axle with the crank arm in the 3 o'clock position. Sit further forwards than this and your knee will be in a weaker position, further back and you'll lose weight over the front wheel.

PICK LINES IN ROCK GARDENS

How to get you and your bike safely through these trail traps

Rock gardens add both fun and fear to the trail. If you get them wrong, you're in for a wild ride, but when you get them right, you can carry your flow and keep on smiling as you go. Here are our top tips for choosing the best way to negotiate them in safety and style.

01
THE SMOOTH LINE

This is the path of least resistance, which avoids the biggest holes and rocks. Body position is key here, so that you can adjust your direction as you go. Lean too far back and you won't be able to steer accurately. Balance too far forward and you'll get caught by a bump. So find a centred position and use your eyes to guide you through, always looking ahead. Stay relaxed and keep your feet level.

02
THE DIRECT LINE

This is as straight as possible, regardless of the obstacles. Momentum is your friend, to help carry you over holes and rocks. Adopt a centred position on the bike, with your heels down and elbows up – you're going to need your arms and legs to act as extra suspension to smooth out the trail. Spot your exit and aim for it. Keep relaxed so you can maintain balance.

03
GET AIRBORNE

For experts, the smoothest way over a rock garden is often to jump the whole thing – providing it's not too long, or at least the gnarliest section isn't. You'll need to have picked out a precise line and exit before attempting this. Body position is crucial – if you land into more rocks and are too far forward, you may get slammed into the handlebar.

01
LOOK BEFORE YOU LEAP

It's always best to inspect a rock garden before you attempt to ride it. Choose a line that suits your ability and build up to hitting it faster and faster.

02
VISION

Potentially the most important tip for all mountain biking, and a necessity here. Keep your eyes looking where you want to go, not at the obstacles you're riding over. This will help keep you in balance and on-line.

03
BODY POSITION

It's important to find a central position on the bike and use the flex in your arms and legs to smooth out the rocks and holes as best you can.

04
FEET LEVEL

Striking your pedals on rocks is asking for trouble. Keeping your feet level helps avoid the rocks and will also keep you in balance and let you move around on the bike as needed.

05
SPEED IS YOUR FRIEND

Carrying speed can help smooth a rock garden out, because your wheels won't fall into every hole. But only go as fast as your skill level allows. Gradually build up to pushing yourself faster.

06
STAY LIGHT ON THE BIKE

In small rock gardens, you can preload your suspension just before you enter and use the rebound to help unweight the bike as you hit the rocks. Get this right and you'll glide over the top.

DON'T STALL ON STEEPS

Follow these technical climbing tips to power on up and leave your mates in the dust

Grinding up sustained steep climbs is one of the most brutal things you can do on a bike. When your heart is thumping in your ears and you're completely blowing out your arse, it's so easy to plough your front wheel into a root, clout a pedal on a rock or stall-out with the back wheel spinning. Many people think that bike skill only comes into play on downhills, but there's a real art to keeping your flow and momentum when you're working hard against gravity too.

01
HEAD UP

Keep your head up and look ahead so you can assess and anticipate what's coming. Use flatter ground to plan your line through techier sections ahead, and catch your breath before attacking the next steep rise.

02
SHIFT EARLY

Think about your gear choice ahead of the hard bits – and shift up early to save mashing your poor derailleur. Gear choice is a personal thing (to a point), with some riders favouring a higher gear and a lower cadence, and others preferring to sit and spin. Either way, it's a balance of being able to keep the cranks turning, and having enough resistance to hop the back wheel up steps and over roots.

03
SMOOTH STROKES

Smooth pedalling is critical for maintaining rear wheel traction on steep, loose terrain. Try to put down consistent power, rather than chopping at the pedals. Clipless pedals help a lot here.

04
TIMING IS KEY

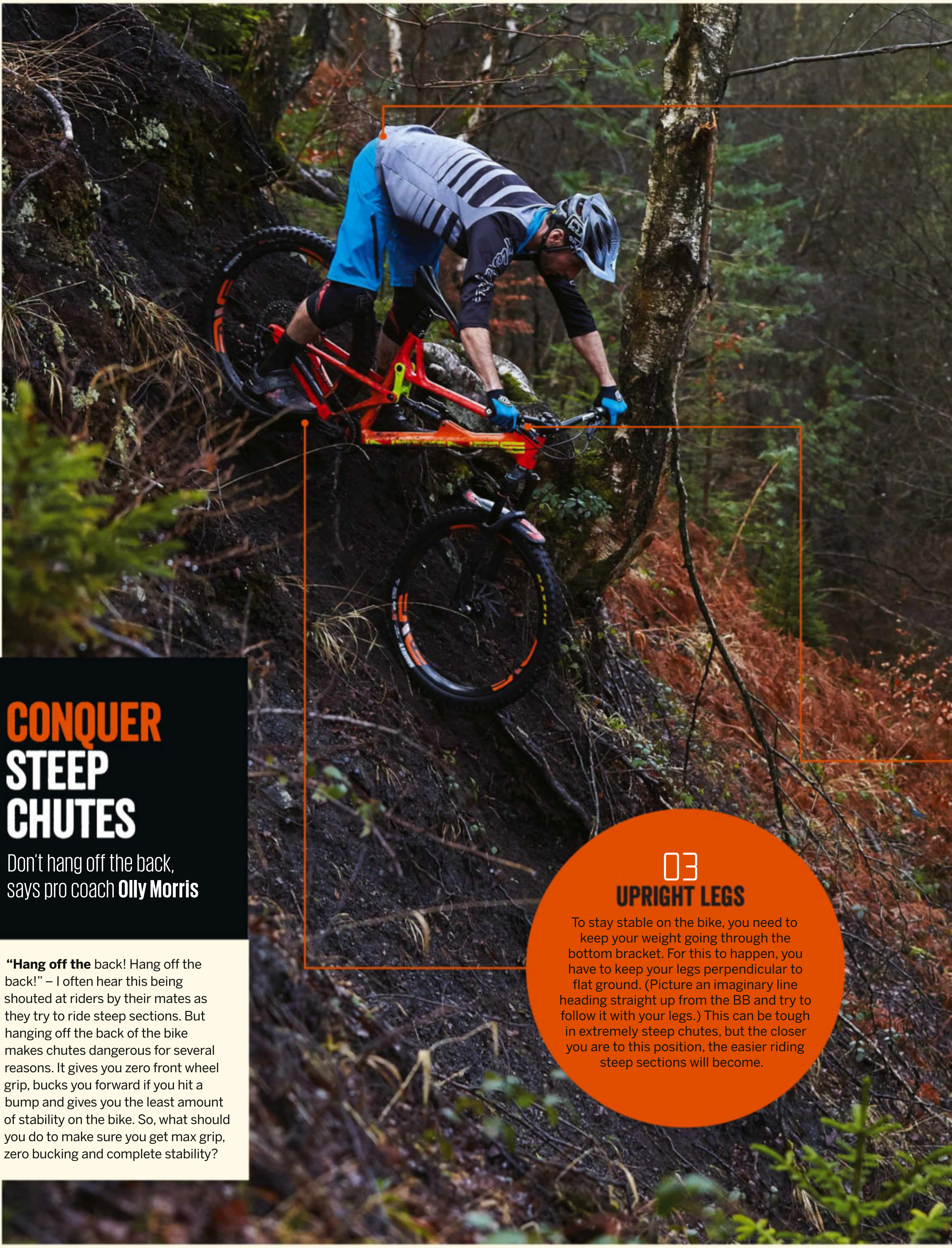
The tricky bit about climbing up rough stuff is that not only do you have to pedal smoothly, you've got to time your strokes so you don't catch the pedals on protruding obstacles. It all comes down to line choice, gear selection and of course, practice.

05
COMFORT INCH

The great thing about dropper posts with 'infinite' adjustment (within their stroke) is that you can drop your saddle a tiny bit for hard climbs. Having your legs fully extended is the most efficient and comfortable way to ride on smooth surfaces, but when you're clambering over rocks and shifting your weight around, the extra bit of manoeuvrability that a lower saddle affords can really help.

06
SADDLE HEIGHT

If your rides involve winching yourself up steep ascents and dropping straight back down, enduro style, then it's worth thinking about tipping your saddle forward by a few degrees. This will situate your body weight more centrally over the bottom bracket on the climbs, and as well as aiding traction, it'll stop your bum slipping off the back.



CONQUER STEEP CHUTES

Don't hang off the back, says pro coach **Olly Morris**

"Hang off the back! Hang off the back!" – I often hear this being shouted at riders by their mates as they try to ride steep sections. But hanging off the back of the bike makes chutes dangerous for several reasons. It gives you zero front wheel grip, bucks you forward if you hit a bump and gives you the least amount of stability on the bike. So, what should you do to make sure you get max grip, zero bucking and complete stability?

03

UPRIGHT LEGS

To stay stable on the bike, you need to keep your weight going through the bottom bracket. For this to happen, you have to keep your legs perpendicular to flat ground. (Picture an imaginary line heading straight up from the BB and try to follow it with your legs.) This can be tough in extremely steep chutes, but the closer you are to this position, the easier riding steep sections will become.

01
BEND AT THE HIPS

This is the main change you should make to your position on the bike as you drop into a steep section. When the front wheel rolls over the edge of the chute, bend further forward from your hips. It may feel counterintuitive, but it'll lower your chest, which will help you keep some bend in your arms. This will mean you'll have better control of the front wheel. Adjust the amount you lean forward to suit the steepness of the slope.

02
LESS FRONT BRAKE

The front brake is useful, but in situations like this, it can be the devil. Using it in steep sections generally puts you and the bike out of balance, especially when the trail is loose or rutted, so try to use it less. If you're trying to ride a rut, applying the brake can drag the wheel out of it. Practise modulating your braking so you can use less front brake.

STEEPS SKILLS

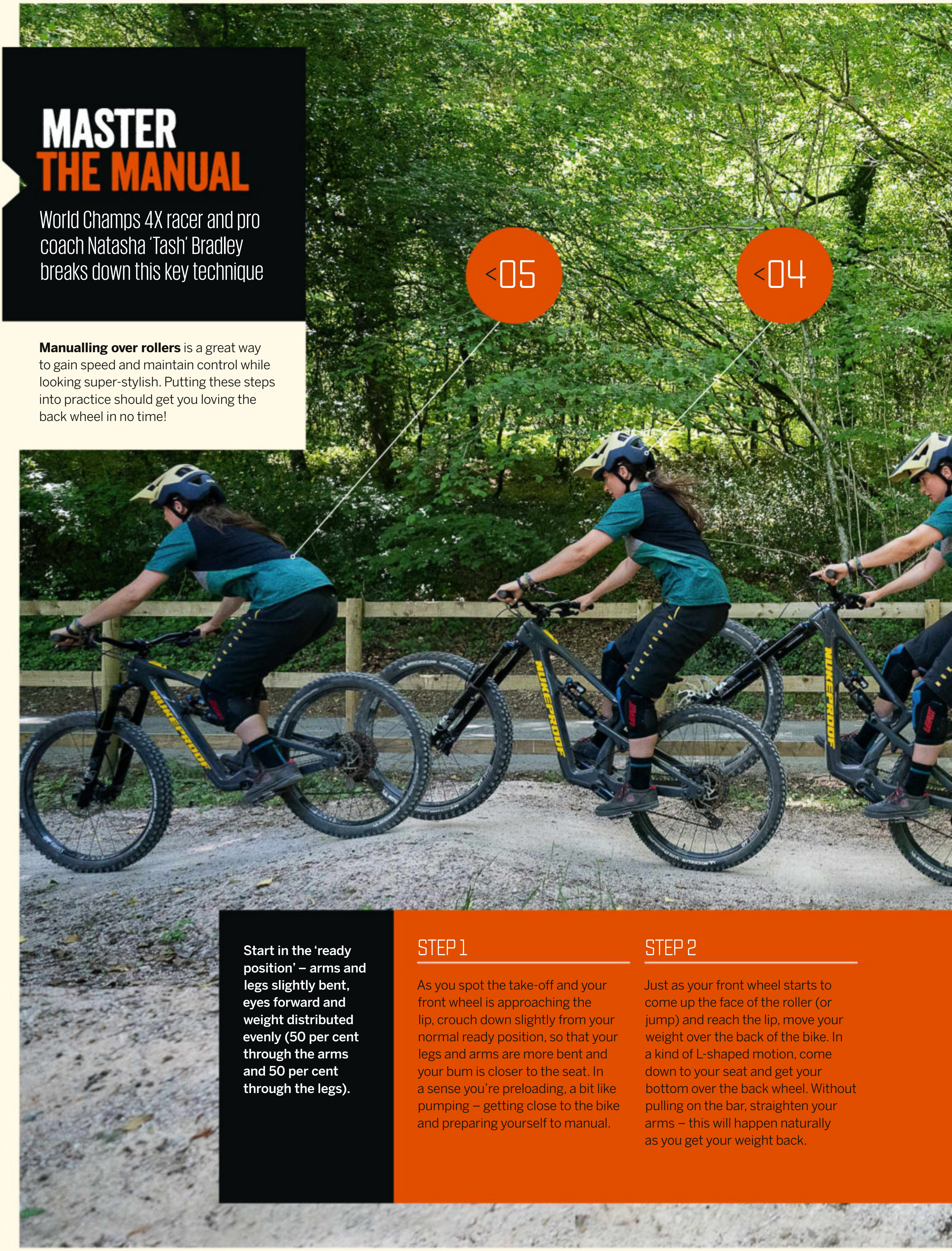
Putting it all together
Approaching the chute, make sure you have a solid posture on the bike with elbows bent, weight through your heels, legs straight but supple and hips bent. As you roll into it, keep your legs as they are and allow the bike to pivot forward by bending more at your hips. Modulate your braking so you use less front brake than rear. With all these actions combined, you should have great grip and stability.

Reacting to trail features
You need to be able to squash (allow the bike to come up to you) and pump (push the bike into the terrain) over undulations while riding the chute. Try to keep your legs extended, because this will give you the space to squash and pump when you get to the bumps.

MASTER THE MANUAL

World Champs 4X racer and pro coach Natasha 'Tash' Bradley breaks down this key technique

Manualling over rollers is a great way to gain speed and maintain control while looking super-stylish. Putting these steps into practice should get you loving the back wheel in no time!



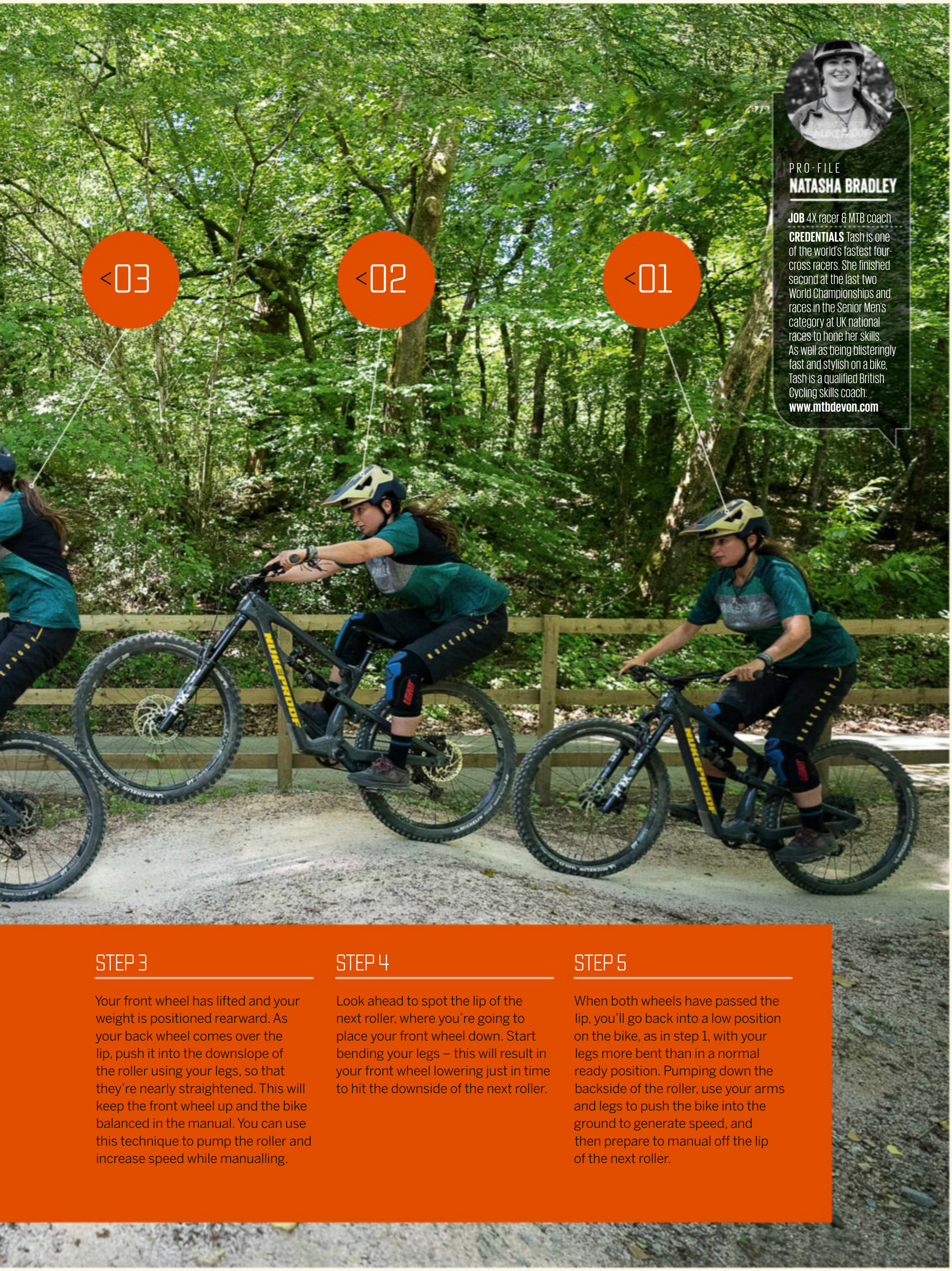
Start in the 'ready position' – arms and legs slightly bent, eyes forward and weight distributed evenly (50 per cent through the arms and 50 per cent through the legs).

STEP 1

As you spot the take-off and your front wheel is approaching the lip, crouch down slightly from your normal ready position, so that your legs and arms are more bent and your bum is closer to the seat. In a sense you're preloading, a bit like pumping – getting close to the bike and preparing yourself to manual.

STEP 2

Just as your front wheel starts to come up the face of the roller (or jump) and reach the lip, move your weight over the back of the bike. In a kind of L-shaped motion, come down to your seat and get your bottom over the back wheel. Without pulling on the bar, straighten your arms – this will happen naturally as you get your weight back.



PRO-FILE
NATASHA BRADLEY

JOB 4X racer & MTB coach

CREDENTIALS Tash is one of the world's fastest four-cross racers. She finished second at the last two World Championships and races in the Senior Men's category at UK national races to hone her skills. As well as being blisteringly fast and stylish on a bike, Tash is a qualified British Cycling skills coach. **www.mtbdevon.com**

STEP 3

Your front wheel has lifted and your weight is positioned rearward. As your back wheel comes over the lip, push it into the downslope of the roller using your legs, so that they're nearly straightened. This will keep the front wheel up and the bike balanced in the manual. You can use this technique to pump the roller and increase speed while manualling.

STEP 4

Look ahead to spot the lip of the next roller, where you're going to place your front wheel down. Start bending your legs – this will result in your front wheel lowering just in time to hit the downside of the next roller.

STEP 5

When both wheels have passed the lip, you'll go back into a low position on the bike, as in step 1, with your legs more bent than in a normal ready position. Pumping down the backside of the roller, use your arms and legs to push the bike into the ground to generate speed, and then prepare to manual off the lip of the next roller.

RIP ROUND A PUMP TRACK

Trail builder, jib master and all-round top bike handler **Nikki Whiles** shows how to impress your mates

Pump tracks are one of the most versatile and accessible types of trail that can be built. They can fit into almost any space, be ridden by nearly anyone on any kind of bike and, if designed well, provide hours of entertainment. Besides which, they get you damn fit in the process! From bike parks to city parks and even schools, new tracks are popping up everywhere these days – and there's even a Pump Track World Champs. While you don't need any riding experience to have a go, there are some basic skills that'll come in handy and that the pump track can help you master. Get these dialled and you'll be blasting out the laps without so much as a pedal stroke.

01
PUMPING

It's all in the name. The main way of generating speed around a track is to pump over the rollers. As you approach a roller, use your arms and legs to push the bike into the upward transition, then as the bike rises over the crest, relax and let it come up towards you. On the downward transition, push the bike away from your body into the slope, extending your arms and pushing down through your heels, to propel yourself forwards.

02
BERMING

Corners shouldn't slow you down, they should be used to generate speed. Again, the key here is pumping and getting the timing right. With berms, you're looking to compress the bike into the apex, then let it spring out by extending your arms and legs. By keeping your head up and looking at the exit, not down at your front wheel, you'll be able to spot your line and resist the urge to brake. Perfect the technique here, then transfer it to berms out on the trails.

PRO-FILE
NIKKI WHILES

Job: Director at Trailcraft and rider for Marin Bikes

CREDENTIALS: As a professional trail builder with a depth of racing experience to draw on, Nikki understands how things should be built and how to ride them. From Wales to Madeira, Nikki has taken on all sorts of projects, and with no shortage of skills himself, he's the ideal test pilot.

PRO TIP

When you've sussed a track, challenge yourself by riding it backwards (alert other riders first!). Look for new lines to conquer too. Can you hold a manual down the whole straight? Can you turn that double into a triple? What about transfers in and out of berms? The only limit is your skill and creativity.

03
JUMPING

When you get familiar with a track and ride it faster, you'll spot rollers that it's easier and smoother to double up on rather than pump through. Designers usually sculpt steeper transitions into the rollers they expect riders to jump, for more lift. Pump into the upslope as you would a roller and use the bike rebounding off the lip to get airborne. Don't pre-empt the movement and bunnyhop or you won't get any kick. Spot your landing, dip the front wheel and push into the downslope for more momentum.

PUMP FOR POWER

Anyone who's ridden a pump track will know how tiring it is. A few laps ridden at full gas are guaranteed to get your thighs burning and heart thumping. This makes it a great form of training, as you're not only developing your anaerobic energy systems, but strengthening the muscles you use to stay poised over the bike. Both of these will have noticeable benefits in your trail riding, and will help you maintain a strong position on the pedals – particularly useful for prolonged downhills. If, like most of us, you'd rather avoid the gym, then fitting a regular pump track session into your weekly biking routine is a great idea. Challenge yourself to see how many laps you can ride in one go, or give yourself a set number of laps to ride at full speed, then rest and repeat.

04
MANUALLING

If the rollers are mellow and don't have much lip, or too far apart to gap, you could pop the bike onto its back wheel. Push into the upslope of the first roller as if pumping, but as the bike reaches the crest drive your hips forward and extend your legs to raise the front wheel. With arms almost straight, use minor weight adjustments to maintain the balance point through the bowl. Aim to drop the front wheel just over the crest of the following roller, or even the next one.

RAZZ A HARDTAIL

No rear bounce? No problem! Here's how to get the most from a rigid-reared bike

Full-sus bikes are so light and versatile these days that it sometimes feels as if there's no place left for the old faithful hardtail. But don't discount bikes with a rigid rear end just yet. They're a load of fun and can teach you a lot of skills. What's more, there's something refreshing about the back-to-basics simplicity of a hardtail, not to mention that they're cheaper and a whole lot easier to maintain, especially in the wetter months.

02
KEEP IT LOOSE

The back wheel can't track the ground as well on a hardtail, so you lose traction more easily. If you ride all tensed up, you won't be able to react and are much more likely to slide out. Similarly, if the back wheel kicks up off an obstacle, you could be sent over the bars. Stay relaxed, allowing the bike to shift around under you, and stay poised, with your knees bent, ready to absorb any impacts.

01
BE SMOOTH

With no rear suspension to get you out of trouble, you've got to rely on your legs for shock damping. Look for smooth lines and things you can use as a kicker (roots, rocks) to gap over rough sections, rather than blindly ploughing into them. When it's too bumpy to pedal, use the bike's rigid rear end to your advantage – pump undulations and the backside of obstacles to generate speed.

BIKE CHOICE AND SET-UP

Bike size

The size you choose has a bigger impact on how a hardtail rides than it does on a full-sus, because frames tend to be higher and don't sag under your weight. Longer top tubes and seat tubes are great for XC, but at the expense of more playful handling. Part of the fun of hardtails is how good they are for mucking around in the woods, so if you're thinking of hitting jumps, then buying a smaller size but fitting a longer dropper seatpost could be the best solution.

Head angle & fork length

When the fork on a hardtail compresses, the geometry is dramatically steepened and tipped forwards. This is why 'hardcore' hardtails often compensate with slacker head angles. Fitting a long-travel fork might seem like a way to make your bike more able to take the hits, but be wary about the impact this can have on its geometry.

Pedal choice

A good pedal connection is essential if you want to ride fast. Flat pedals need to be grippy and paired with tacky-soled shoes. If you've never given clipless (aka clip-in) pedals a go, they're worth considering for hardtail riding. Having your feet locked in place is one less thing to think about and can give you the confidence to go full-bore into burly terrain.

Tyre size and width

The damping properties of your tyres are particularly apparent on a hardtail. Wider, higher-volume tyres add rolling resistance but make for a smoother ride. Plus-size tyres are worth considering, but if you don't want to bulk up that much, look at the new breed of wider trail tyres (2.4-2.6in). Fitting them to wide rims (28-30mm internal) will give them a good profile and make for bucketloads of traction.

03
STAY PLANTED

Because feedback from the trail is transmitted straight through the pedals, your feet can easily patter off flat pedals if you ride with poor technique. Keeping your heels dropped means that when you hit a bump, your foot is pushed into the pedal rather than bounced off it. If you lack the flexibility to drop your heels properly, then some ankle mobility exercises will help.

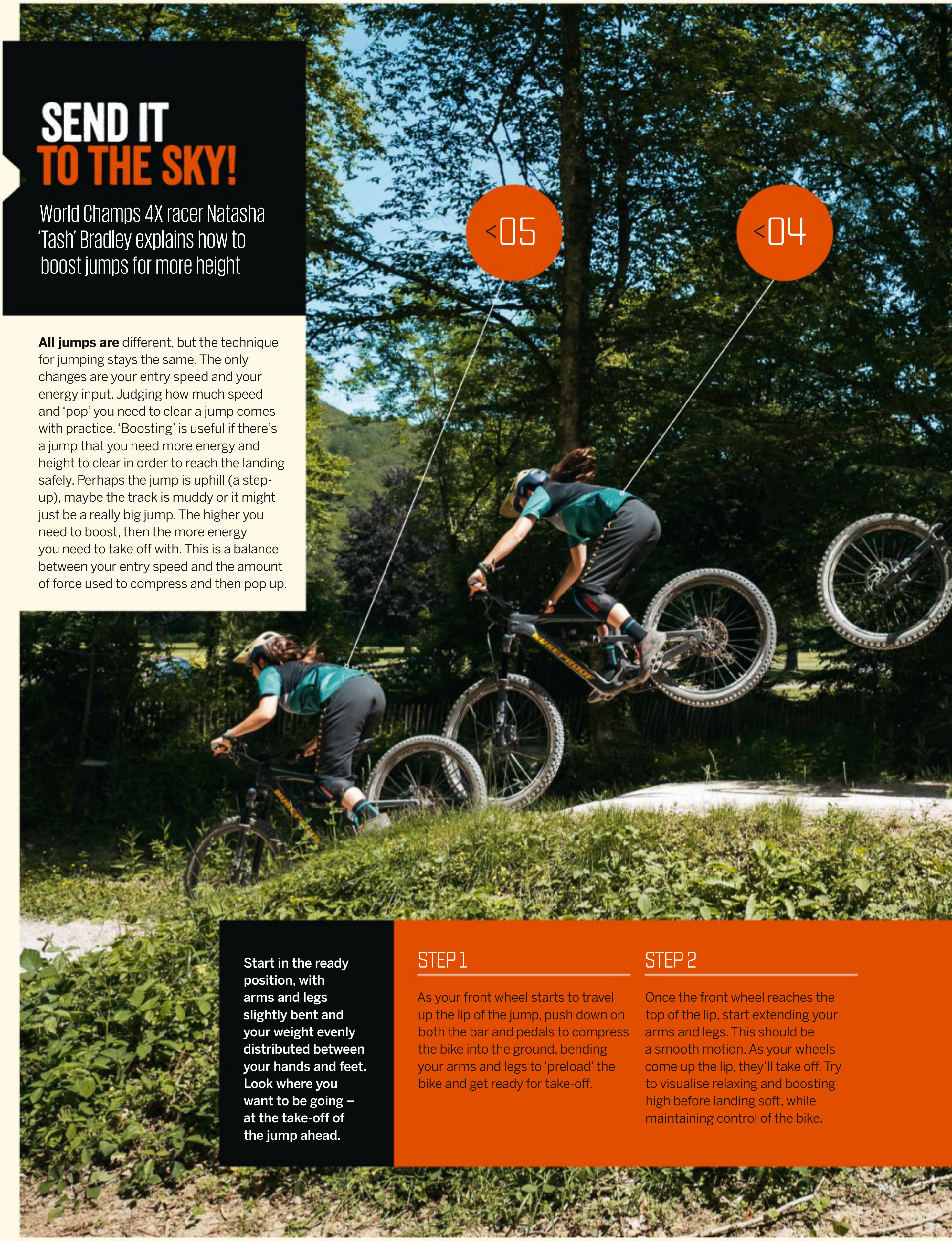
RIDE EVERYWHERE!

The adaptability of hardtails is one of the things that makes them great. You can use the same bike to rip around a BMX track and then take on a bikepacking adventure in the wilderness, just by raising the saddle and adding a few bags. Trail centres, big days of bridleway bashing, even DH racing if you've got the balls – you name it, a hardtail can do it! If your local riding spot lacks technical terrain or feels a bit tame with 160mm of travel underneath you, pull out the hardtail and scare yourself trying to hold the same speed!

SEND IT TO THE SKY!

World Champs 4X racer Natasha 'Tash' Bradley explains how to boost jumps for more height

All jumps are different, but the technique for jumping stays the same. The only changes are your entry speed and your energy input. Judging how much speed and 'pop' you need to clear a jump comes with practice. 'Boosting' is useful if there's a jump that you need more energy and height to clear in order to reach the landing safely. Perhaps the jump is uphill (a step-up), maybe the track is muddy or it might just be a really big jump. The higher you need to boost, then the more energy you need to take off with. This is a balance between your entry speed and the amount of force used to compress and then pop up.



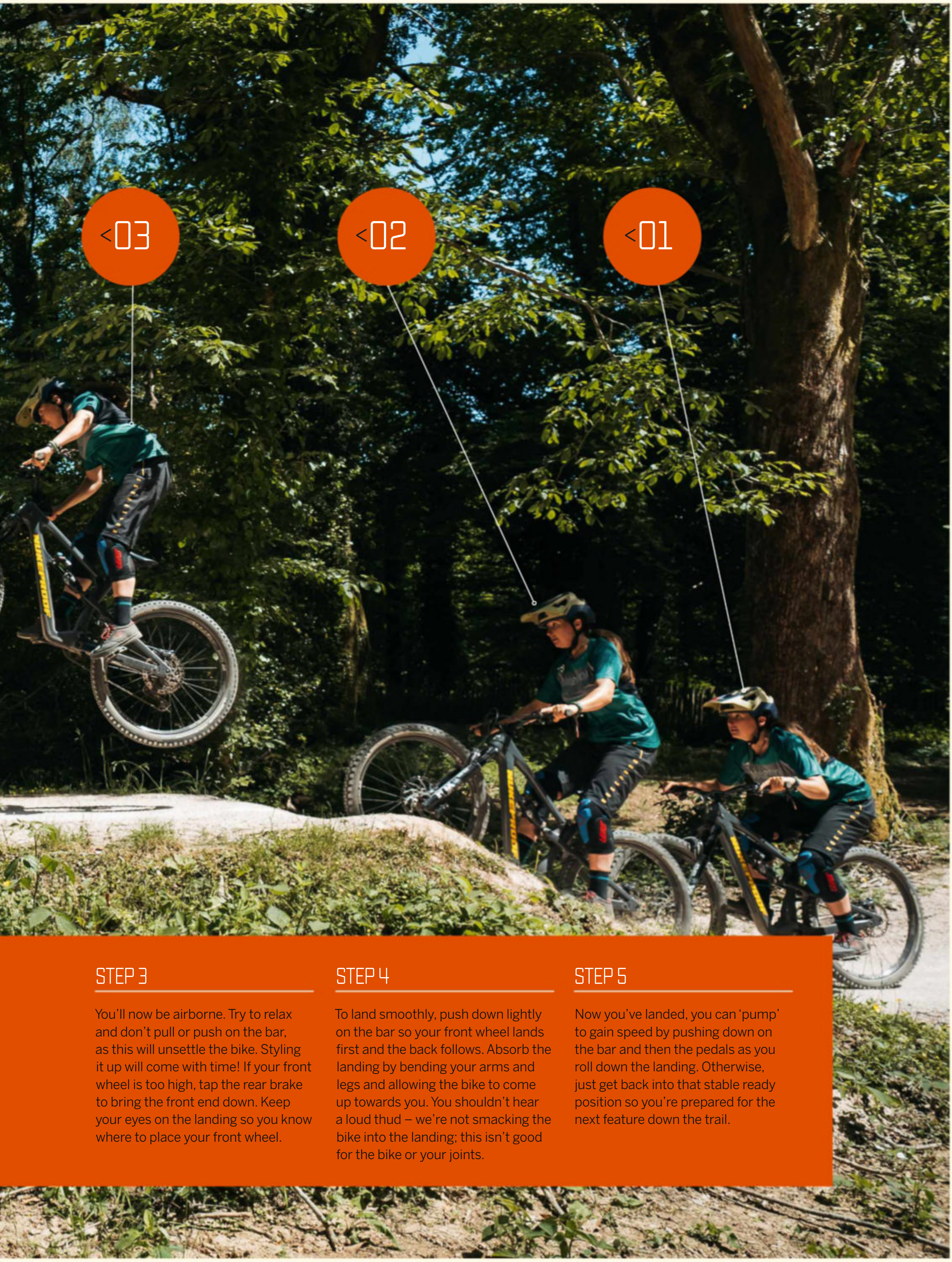
Start in the ready position, with arms and legs slightly bent and your weight evenly distributed between your hands and feet. Look where you want to be going – at the take-off of the jump ahead.

STEP 1

As your front wheel starts to travel up the lip of the jump, push down on both the bar and pedals to compress the bike into the ground, bending your arms and legs to 'preload' the bike and get ready for take-off.

STEP 2

Once the front wheel reaches the top of the lip, start extending your arms and legs. This should be a smooth motion. As your wheels come up the lip, they'll take off. Try to visualise relaxing and boosting high before landing soft, while maintaining control of the bike.



STEP 3

You'll now be airborne. Try to relax and don't pull or push on the bar, as this will unsettle the bike. Styling it up will come with time! If your front wheel is too high, tap the rear brake to bring the front end down. Keep your eyes on the landing so you know where to place your front wheel.

STEP 4

To land smoothly, push down lightly on the bar so your front wheel lands first and the back follows. Absorb the landing by bending your arms and legs and allowing the bike to come up towards you. You shouldn't hear a loud thud – we're not smacking the bike into the landing; this isn't good for the bike or your joints.

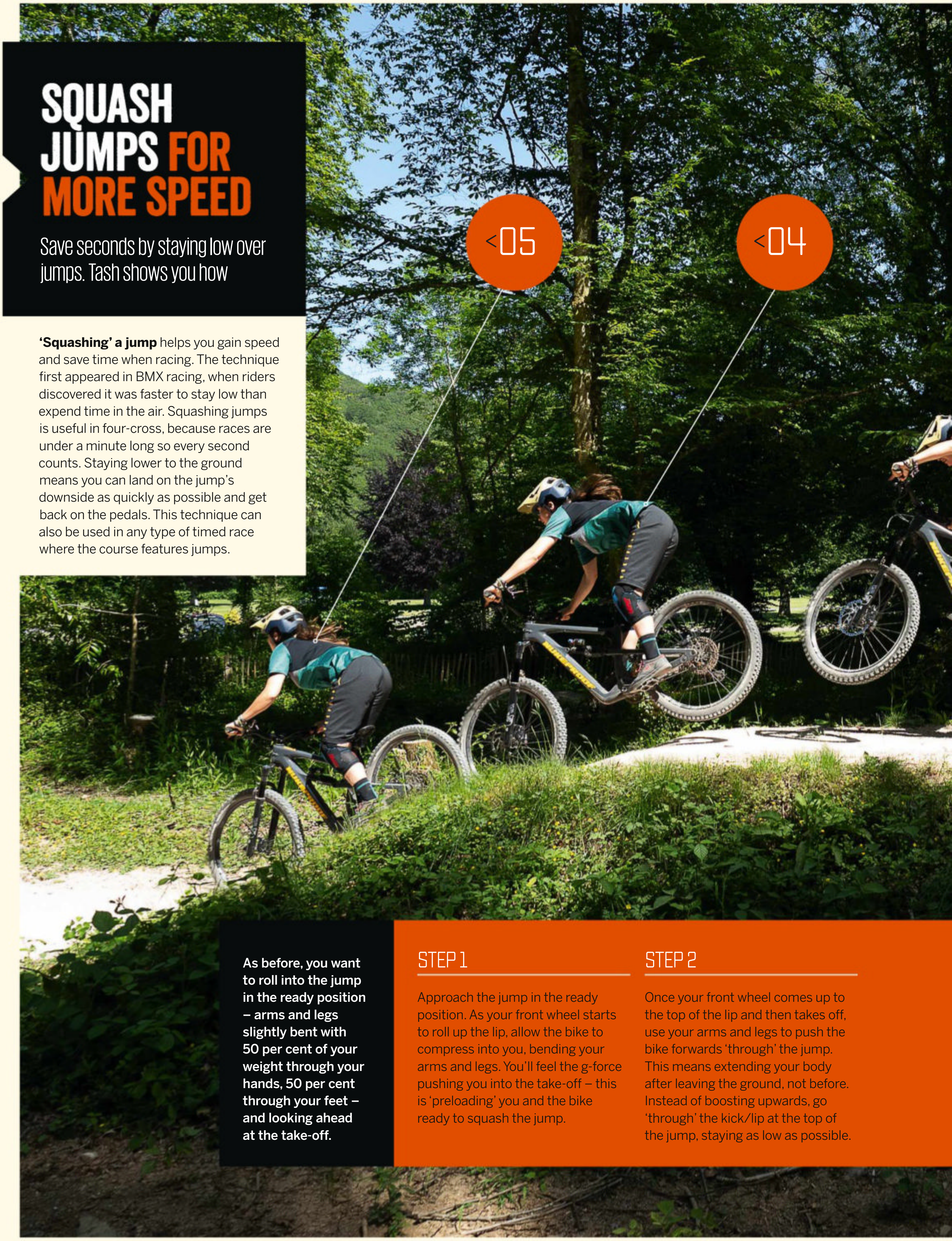
STEP 5

Now you've landed, you can 'pump' to gain speed by pushing down on the bar and then the pedals as you roll down the landing. Otherwise, just get back into that stable ready position so you're prepared for the next feature down the trail.

SQUASH JUMPS FOR MORE SPEED

Save seconds by staying low over jumps. Tash shows you how

'Squashing' a jump helps you gain speed and save time when racing. The technique first appeared in BMX racing, when riders discovered it was faster to stay low than expend time in the air. Squashing jumps is useful in four-cross, because races are under a minute long so every second counts. Staying lower to the ground means you can land on the jump's downside as quickly as possible and get back on the pedals. This technique can also be used in any type of timed race where the course features jumps.



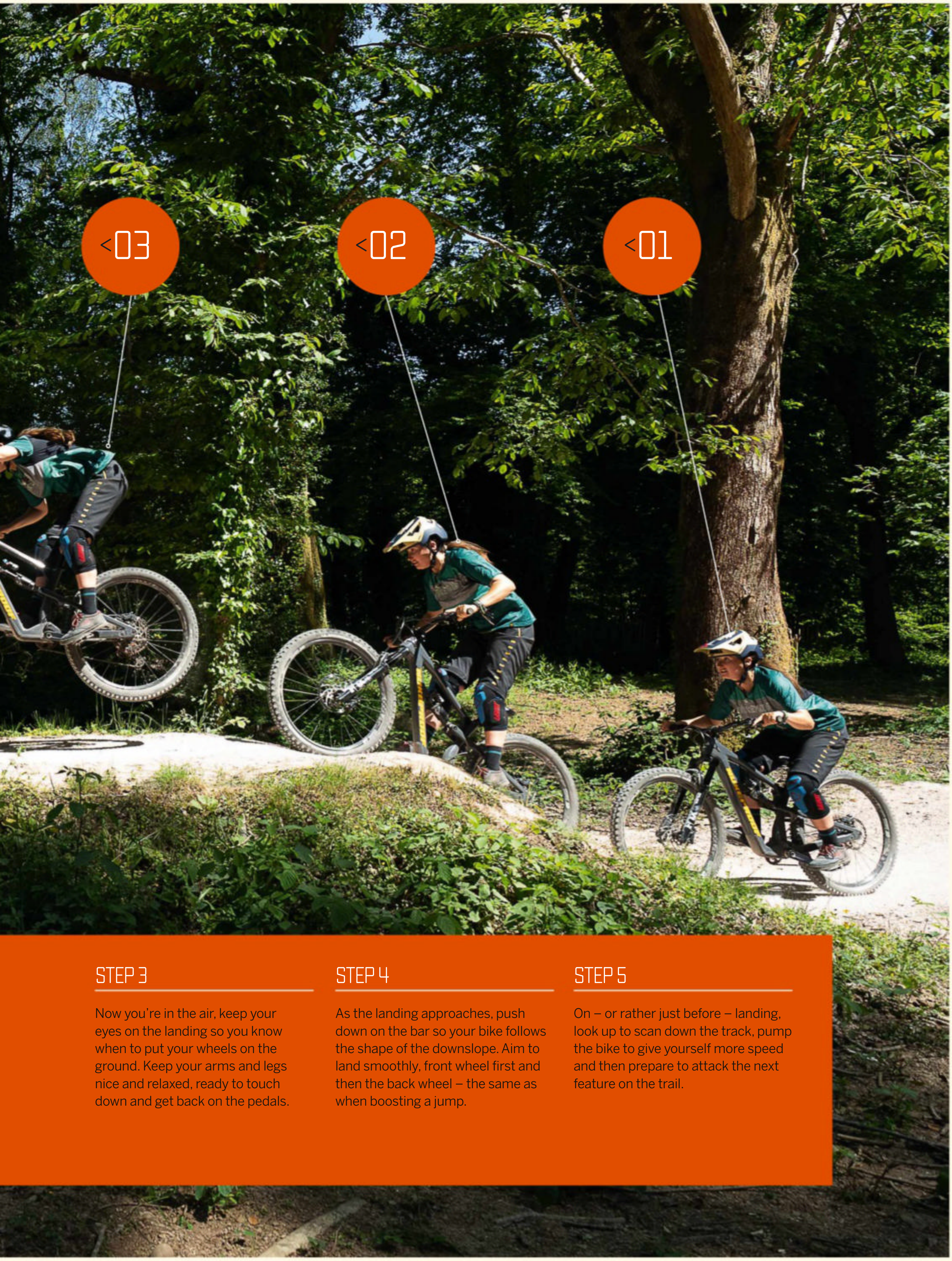
As before, you want to roll into the jump in the ready position – arms and legs slightly bent with 50 per cent of your weight through your hands, 50 per cent through your feet – and looking ahead at the take-off.

STEP 1

Approach the jump in the ready position. As your front wheel starts to roll up the lip, allow the bike to compress into you, bending your arms and legs. You'll feel the g-force pushing you into the take-off – this is 'preloading' you and the bike ready to squash the jump.

STEP 2

Once your front wheel comes up to the top of the lip and then takes off, use your arms and legs to push the bike forwards 'through' the jump. This means extending your body after leaving the ground, not before. Instead of boosting upwards, go 'through' the kick/lip at the top of the jump, staying as low as possible.



STEP 3

Now you're in the air, keep your eyes on the landing so you know when to put your wheels on the ground. Keep your arms and legs nice and relaxed, ready to touch down and get back on the pedals.

STEP 4

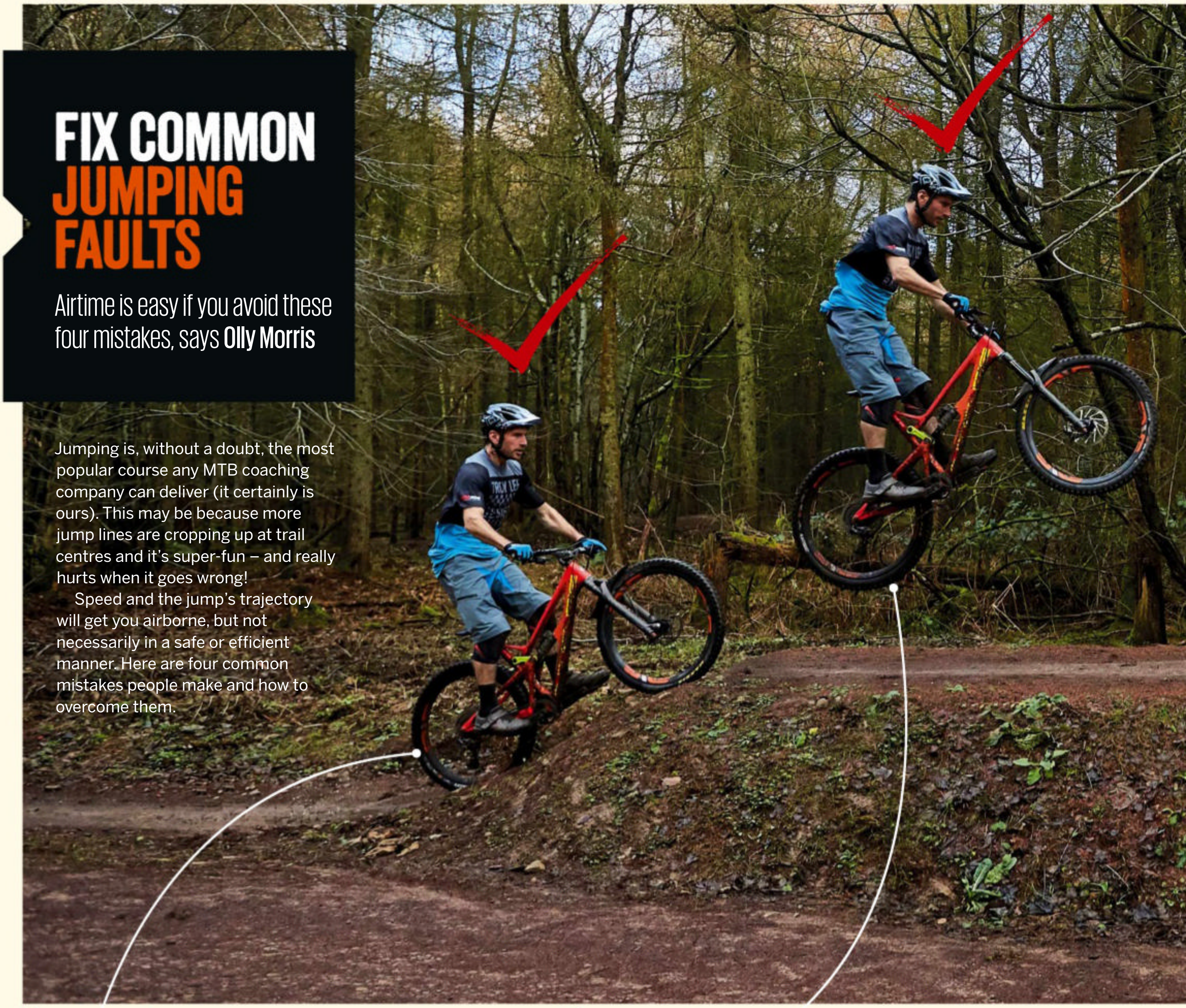
As the landing approaches, push down on the bar so your bike follows the shape of the downslope. Aim to land smoothly, front wheel first and then the back wheel – the same as when boosting a jump.

STEP 5

On – or rather just before – landing, look up to scan down the track, pump the bike to give yourself more speed and then prepare to attack the next feature on the trail.

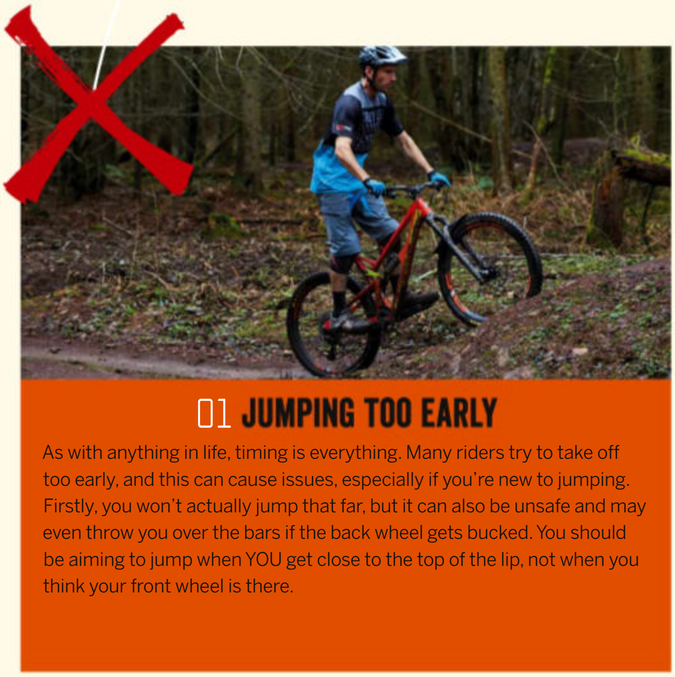
FIX COMMON JUMPING FAULTS

Airtime is easy if you avoid these four mistakes, says **Olly Morris**



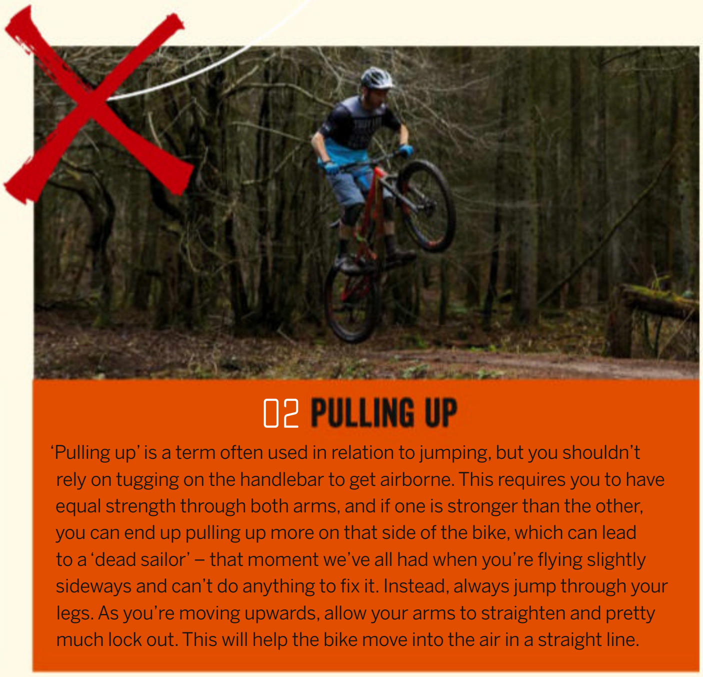
Jumping is, without a doubt, the most popular course any MTB coaching company can deliver (it certainly is ours). This may be because more jump lines are cropping up at trail centres and it's super-fun – and really hurts when it goes wrong!

Speed and the jump's trajectory will get you airborne, but not necessarily in a safe or efficient manner. Here are four common mistakes people make and how to overcome them.



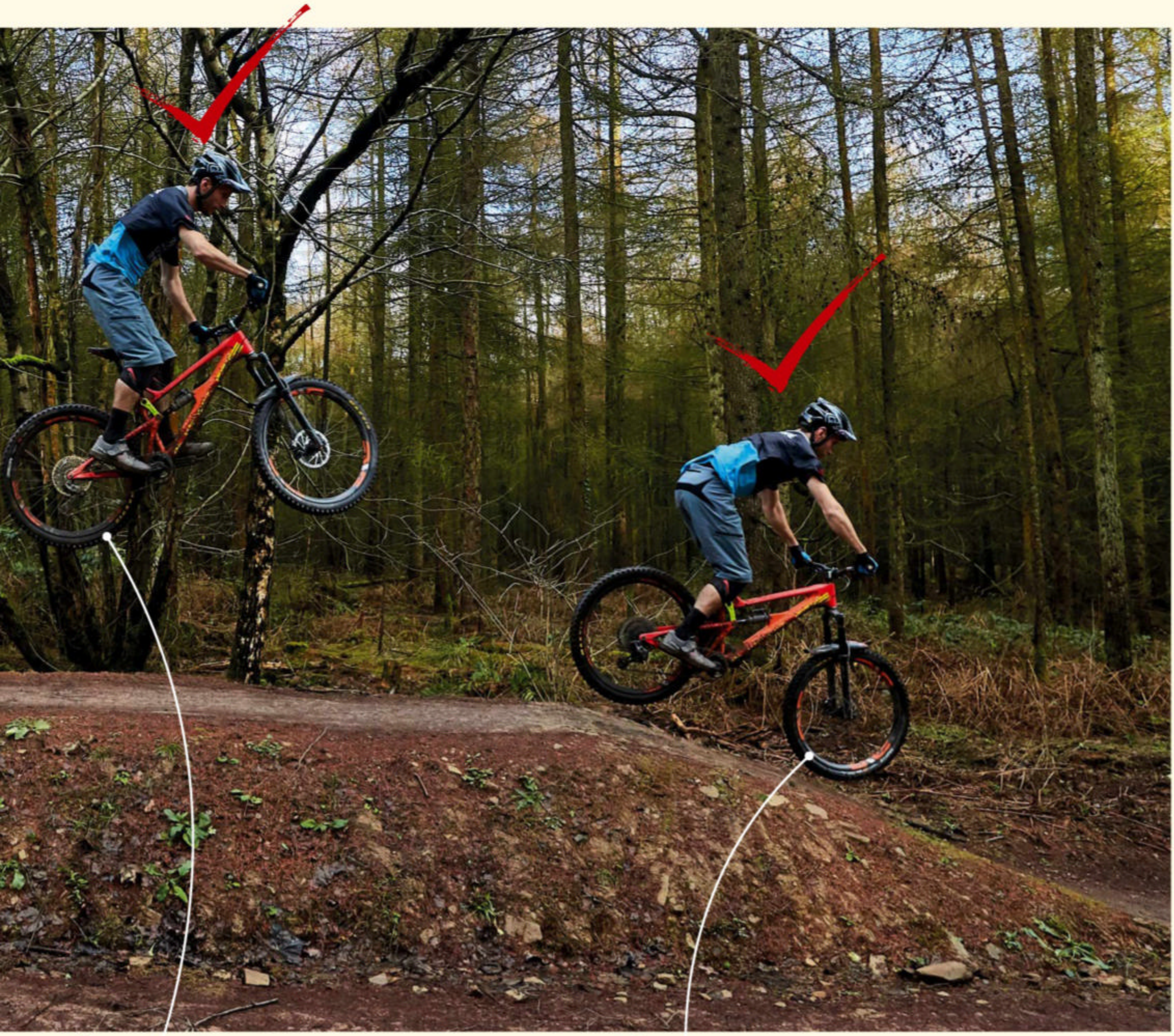
01 JUMPING TOO EARLY

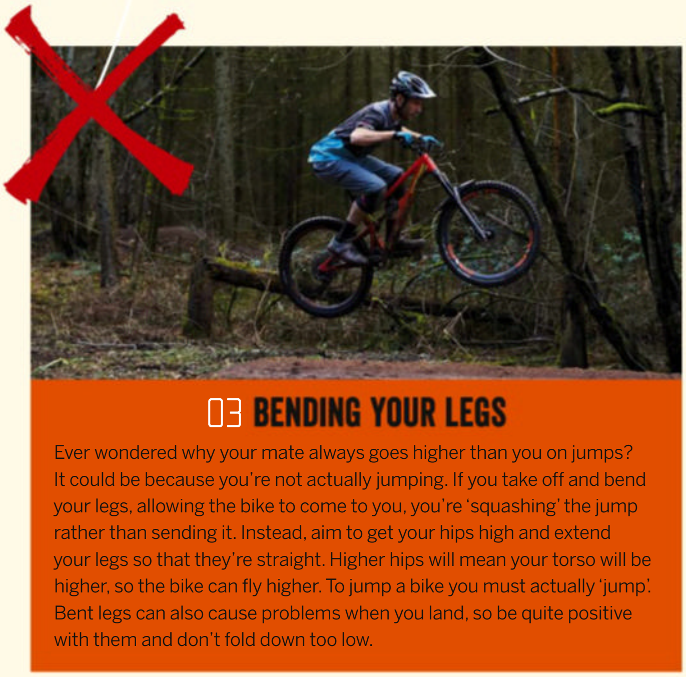
As with anything in life, timing is everything. Many riders try to take off too early, and this can cause issues, especially if you're new to jumping. Firstly, you won't actually jump that far, but it can also be unsafe and may even throw you over the bars if the back wheel gets bucked. You should be aiming to jump when YOU get close to the top of the lip, not when you think your front wheel is there.



02 PULLING UP

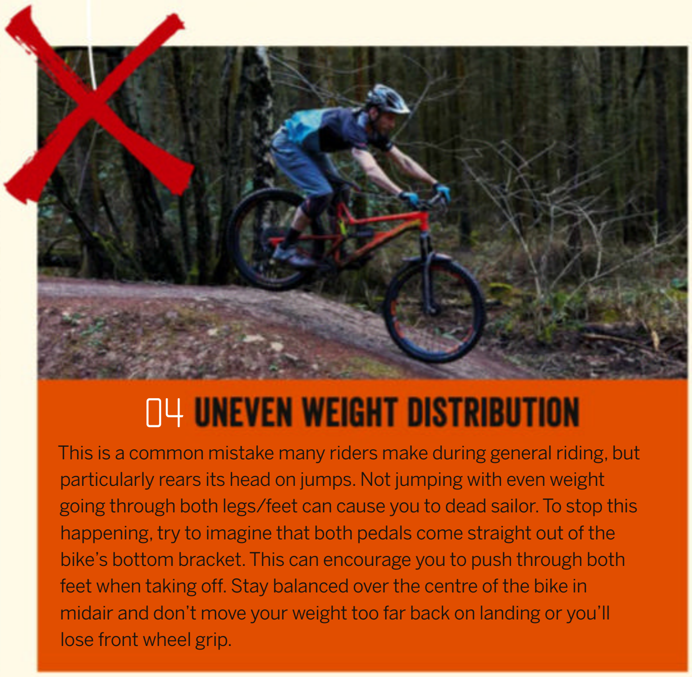
'Pulling up' is a term often used in relation to jumping, but you shouldn't rely on tugging on the handlebar to get airborne. This requires you to have equal strength through both arms, and if one is stronger than the other, you can end up pulling up more on that side of the bike, which can lead to a 'dead sailor' – that moment we've all had when you're flying slightly sideways and can't do anything to fix it. Instead, always jump through your legs. As you're moving upwards, allow your arms to straighten and pretty much lock out. This will help the bike move into the air in a straight line.





03 BENDING YOUR LEGS

Ever wondered why your mate always goes higher than you on jumps? It could be because you're not actually jumping. If you take off and bend your legs, allowing the bike to come to you, you're 'squashing' the jump rather than sending it. Instead, aim to get your hips high and extend your legs so that they're straight. Higher hips will mean your torso will be higher, so the bike can fly higher. To jump a bike you must actually 'jump'. Bent legs can also cause problems when you land, so be quite positive with them and don't fold down too low.



04 UNEVEN WEIGHT DISTRIBUTION

This is a common mistake many riders make during general riding, but particularly rears its head on jumps. Not jumping with even weight going through both legs/feet can cause you to dead sailor. To stop this happening, try to imagine that both pedals come straight out of the bike's bottom bracket. This can encourage you to push through both feet when taking off. Stay balanced over the centre of the bike in midair and don't move your weight too far back on landing or you'll lose front wheel grip.

FIX COMMON CORNERING MISTAKES

Avoid these four errors and you'll soon be rippin' round turns, says coach **Olly Morris**

When you hit a corner well, you know it – the bike just grips, you exit with speed and the whole process feels effortless. But what if you find that you're losing all your speed in turns, sliding out or, even worse, crashing? The key to learning to corner confidently and smoothly is to avoid some common mistakes and build consistency. Here are four things that a lot of riders get wrong – and how to fix them.

PEDALLING OUT OF THE CORNER

I'm sure you've been there, chasing your mate who's a little bit faster than you. You start to pedal out of the corners to keep up, but they keep pulling away. That's because pedalling out of the corners unbalances the bike, reducing grip, and therefore speed. The best way to gain speed from a corner is to ride it correctly. Then you can add pedalling.

MAXXIS
DT SWISS

STARING AT THE FRONT WHEEL

Looking at your front wheel can mean you make small, pointless adjustments to the steering. This unbalances the bike. Mid-corner adjustments should be made using feedback through the bike, when you feel something happening, not based on what you see in front of your wheel. When you get to the main leaning point of the corner, look for a specific point further down the trail where you need to be heading – a tree or something off to the side. This will help stop you staring at the front wheel.

TURNING THE BAR, NOT LEANING THE BIKE

I often see people not leaning the bike properly in corners. A bike turns from leaning, not from turning the handlebar. Practise giving the bike freedom of movement under you. One key technique that helps this freedom is dynamic elbow movement.

BRAKING IN THE CORNER, NOT BEFORE IT

This one sounds obvious, but we all brake in the middle of corners too often. A good way to overcome this is to find a turn to practise on and use a marker to work out your braking point. Put the marker on the straight leading into the corner, a good distance back from it. Ride the corner. If you hit it confidently, move the marker closer to the turn and try again. If not, either try again or move the marker back a bit.

ADVANCED TIPS

I'm a huge believer in experimentation during skills practice and training. Here are three things you can play with to help you with your cornering

01 Ride height

Practise hitting the same turn repeatedly while adjusting how low you get your chest relative to the handlebar. Try really low (by bending your arms a lot), try really high and experiment until you find the optimum position. Generally, a lower riding position should give you more front-end control, but find the right balance for you – and the corner you're riding.

02 Pedal position

People often argue over whether you should have your outside pedal down or not when cornering. The answer is that it depends on the turn. Practise riding a variety of corners where you keep your cranks flat and outside foot down. You can also try adjusting how far down you have your outside foot. Figure out what gives you the most grip and stability.

03 Pumping

Try 'pumping' – extending your legs to push the bike into the corner – at different stages in the turn. After a bit of practice, you'll start to find the 'sweet spot' and begin bouncing out of the corner. This is a more advanced skill, so build up to it slowly.

NAIL UNKNOWN TRAILS

Anyone can go fast on familiar tracks, but riding blind takes skill

Riding 'blind' and doing it well is something that'll test all your skills as a mountain biker, with the need for good bike-handling skills and the ability to make split-second judgments on the fly. Mastery will not only make new places and unfamiliar trails more fun to ride, but it's an essential skill if you fancy trying out enduro racing. The key is to anticipate what's coming and be confident, without being reckless.

01
THINK AHEAD

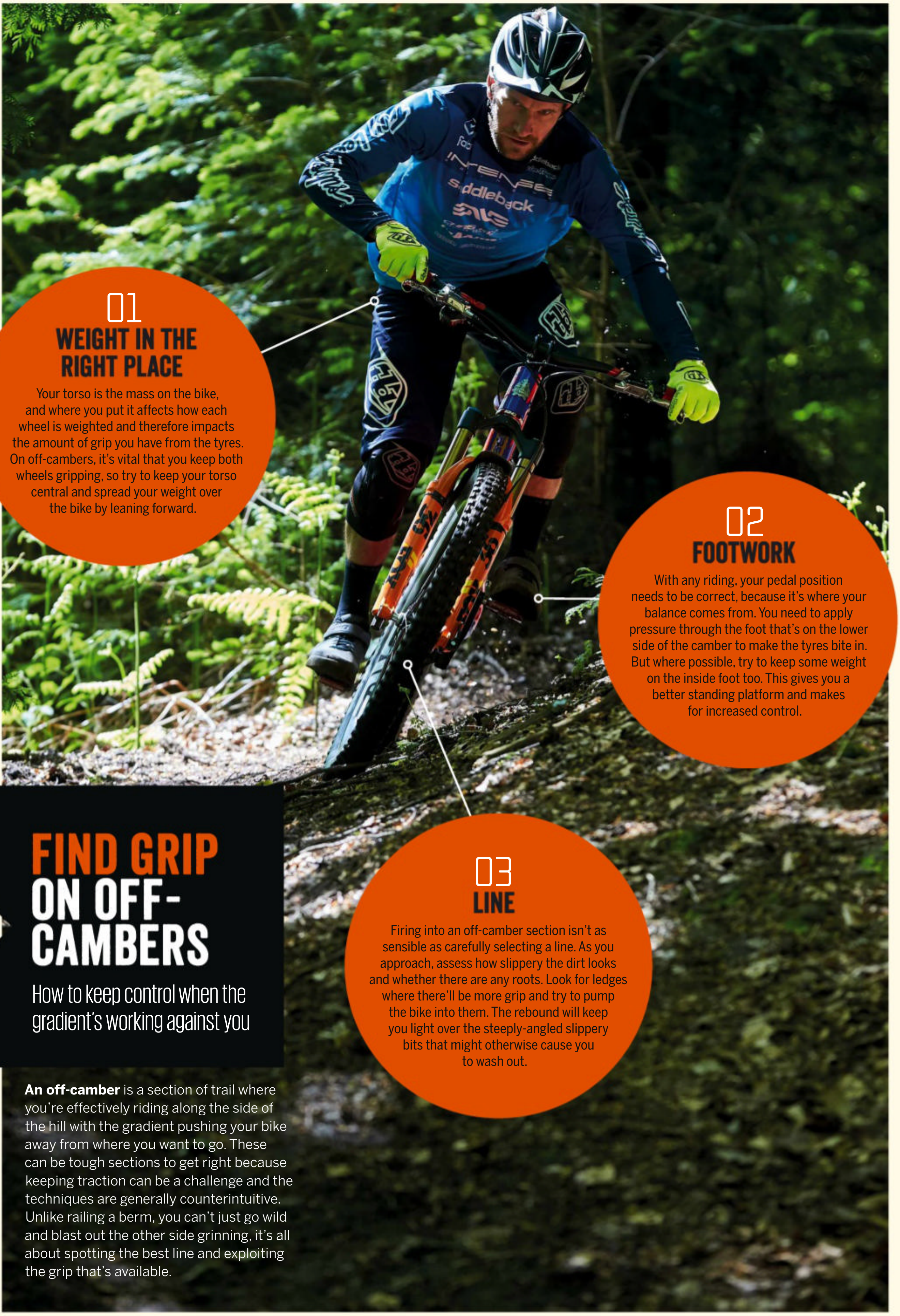
Knowledge of the type of trails in the area and what you've ridden so far can help you predict what might be coming next. If it's been tight, rooty turns up to this point, chances are there's more of the same. If the dirt has felt grippy and you think you've been a bit tentative, then try pushing a bit harder. If it's more slippery than expected, look for easier lines and brake early.

02
HEAD UP

Vision is the most important thing. Looking ahead and not at your front wheel will give you the most amount of time to spot your line and prepare for what's coming. The faster you're going, the further ahead your eyes need to be focused. Once you've committed to your line, be assertive. Hesitation or braking midway through is likely to make you lose traction.

03
READY TO REACT

No amount of guesswork can fully prepare you for what's over the next crest, but staying poised centrally over the bike in the attack position will allow you to respond to any scenario. Command the bike, but stay loose so you don't get kicked offline by that stray rock or slippery root. On jumps, err on the side of going a bit long first time and keep the front wheel up.



FIND GRIP ON OFF-CAMBERS

How to keep control when the gradient's working against you

An off-camber is a section of trail where you're effectively riding along the side of the hill with the gradient pushing your bike away from where you want to go. These can be tough sections to get right because keeping traction can be a challenge and the techniques are generally counterintuitive. Unlike railing a berm, you can't just go wild and blast out the other side grinning, it's all about spotting the best line and exploiting the grip that's available.

01

WEIGHT IN THE RIGHT PLACE

Your torso is the mass on the bike, and where you put it affects how each wheel is weighted and therefore impacts the amount of grip you have from the tyres. On off-cambers, it's vital that you keep both wheels gripping, so try to keep your torso central and spread your weight over the bike by leaning forward.

02

FOOTWORK

With any riding, your pedal position needs to be correct, because it's where your balance comes from. You need to apply pressure through the foot that's on the lower side of the camber to make the tyres bite in. But where possible, try to keep some weight on the inside foot too. This gives you a better standing platform and makes for increased control.

03

LINE

Firing into an off-camber section isn't as sensible as carefully selecting a line. As you approach, assess how slippery the dirt looks and whether there are any roots. Look for ledges where there'll be more grip and try to pump the bike into them. The rebound will keep you light over the steeply-angled slippery bits that might otherwise cause you to wash out.

HAVE A GO AT DOWNHILL RACING

Experience the exhilarating thrill of racing against the clock

We get that not all mountain bikers are racers, but there really is something special about pushing yourself as fast as you can on a bike. And there's no better place to do that than at a downhill race. You inspect the track before you ride, the route is clearly marked and medics are on-site at all times. If you're a rider who's always trying to gas the descents as fast as possible, try downhill racing – it may well be a challenge you'll relish.

01

PREP BEFORE YOU GO

Making sure you have your bike organised, kit ready, food and water supplies stocked up, and your sleeping arrangements sorted – whether that's camping or something more luxurious – before you get to the race site will relieve a lot of stress while you're there and allow you to concentrate on your main mission – riding your bike as fast as you can.

02

WALK THE TRACK

Walking the course before practice is a great way to get a head start on knowing where to go. Use this first track walk to get the lay of the land, rather than pinpointing your exact lines. Lines will develop throughout practice, so be open to changing them. Most riders will walk the course again on Saturday evening to finalise their line choice ready for race day on Sunday (if it's a two-day event).

YOU DON'T NEED A DOWNHILL BIKE

You may be surprised to hear it, but you don't need a DH bike to go DH racing. The UK is a fantastic place for mountain biking, but outside of Scotland and Wales it doesn't have a lot of actual mountains, so lots of our DH tracks are ideal for enduro/trail bikes. Many races use these same tracks and, while some places - Fort William for example - are DH bike territory, you can ride a lot of race venues in the UK on a single-crown-forked enduro bike.

03

BUILD UP YOUR SPEED

You should try to build up your speed gradually over the weekend. Remember, your fastest runs should be your race runs on the Sunday afternoon. It's tiring trying to ride flat-out constantly, and doing so can lead to mistakes and crashes. Learn the track at a sensible pace, then gradually ride sections faster and faster. You can split the course up in practice too, so you're not hitting every part of the track as quickly as you can on each run.

04

WARM-UPS ARE IMPORTANT

Downhill races are hugely physical activities and there's a lot of time between runs, during which your body will cool down. It's a good idea to perform a short warm-up at the start of each run, to help your body and mind prepare for the effort they're about to endure. Plus, it's beneficial to loosen up any stiff joints to help reduce the risk of injury, should you find yourself tussling with the ground.

05

CONCENTRATE ON PERFORMANCE, NOT RESULTS

Putting pressure on yourself to achieve a specific result is a sure-fire way to add stress to your racing. Remember, you're racing the clock, and the best way to get your quickest time is to focus on your riding. Don't overload yourself with too much information, pick one or two points – be it your lines, braking or body position – that'll help you get down the hill the fastest you can. A good result isn't about your finishing position, it's about achieving a performance you're personally proud of.

TECHNIQUE TROUBLE-SHOOTING

We dig down to the roots of 6 common riding faults with the help of pro coach **Olly Morris**

An excellent way to think about what you need to improve is to start by looking at what's going wrong. I like to think about it as symptoms and causes. Trying to stop 'performing' a symptom isn't the best way to fix it. Instead, think about why the symptom happens by troubleshooting. Have a look at these common symptoms and some ideas for how you can start to improve them.

01

DRAGGING THE BRAKES IN CORNERS

Most riders are aware that they shouldn't brake through corners, because it's terrible for grip and control. However, it's bloody hard to avoid doing it. I'm sure we all have this fault, but is it as simple as just telling ourselves to stop doing it? Usually, there's more to it than that. The thing to look at here is how you're setting up for the turn. Are you braking early enough and are you riding on the smooth, wide line? How much are you leaning the bike? Where are you looking? (Because you ride where you look.) If you can get your entry speed, line set-up, lean and vision correct, you'll be far less likely to use the brakes through the corner.

02

HARSH LANDINGS FROM DROPS

There are many ways to ride a drop-off. You can use drop techniques or jump techniques – it all depends what you're landing on. To land a high drop or a drop-to-flat smoothly, look at how low you're setting your body position as you go off the drop. The lower your weight is before it goes off the drop, the less distance it has to fall. Many riders manage to keep their front wheel high enough to safely ride off drops, but if their weight is too high they have a long way to drop, which increases the landing impact.

03

FRONT-WHEEL WASHOUT IN CORNERS

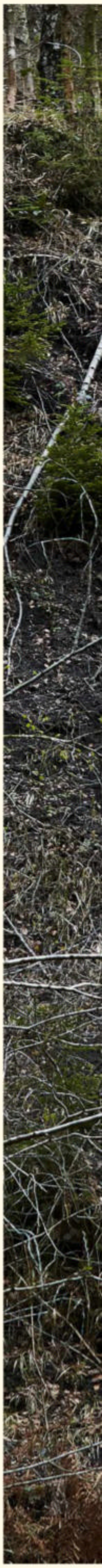
Don't you hate that feeling of not trusting the front wheel in corners? When it slides, it can happen so fast that it dumps you on the ground. The challenge here is that the fix is counter-intuitive. Think about where your weight is on the bike. In simple terms, your weight is your torso. The main reason your front wheel will slide is your riding position being too far back. Bringing your upper body forward will give you more front-wheel grip. This one will take a lot of practice because it isn't easy to get your weight balanced between the wheels, but when it is, cornering will become easier and you'll have more grip and confidence.

04
SLIDING ON ROOTS

This is another frustrating and potentially painful problem. Sliding on roots, especially wet ones, can be challenging to avoid, but considering some key points will help lower your chances of it happening. Number one is to stay relaxed – if you're stiff, your bike won't be able to move around underneath you. You also need to think about your line through the roots. Where possible, try to hit each root as squarely as you can – even if it means your line isn't that straight. Finally – especially if you can't tackle the roots squarely – you need to adjust the force you hit them with. Slightly unweighting the bike before the roots will help prevent the tyres sliding.

05
NOSEDIVING JUMPS

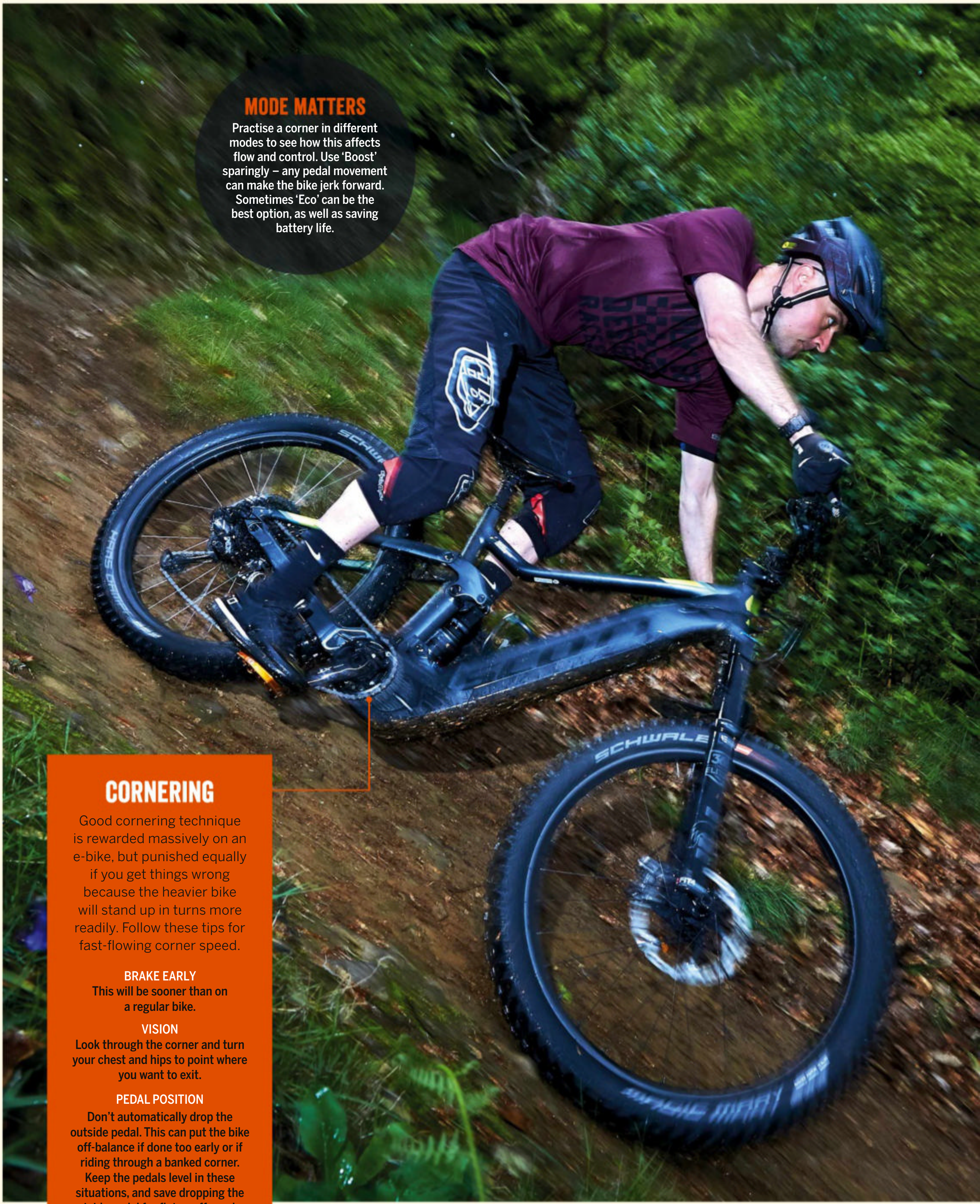
One thing we all want to avoid is nosediving a jump, because the feeling of going over the bars is so scary. It's possible to get away with a nosedive by moving your weight in mid-air, but let's troubleshoot why it happens in the first place. There can be many reasons, such as incorrect timing or taking off from the wrong angle. When people jump and move their body backwards, that often causes a forward rotation, putting the bike into a nosedive. Another super-common problem I see is riders not using enough pressure through their arms as they go up the lip. They apply loads of force through their legs, but adding a little bit of weight through their arms can help the front wheel pop up equally – a simple fix.



06

ARM PUMP ON STEEP TRAILS

This is particularly important on longer trails. Your arms can pump up, your hands can become sore or you can end up taking too much load through your shoulders. It's something many of us just put up with. Training in the gym is one way to help with this, but there are things you can fix in your riding first. Think about where your weight is on the bike. It needs to be supported by your legs, so you need to be balanced correctly. If your weight is too far back you'll be hanging off your hands, and if it's too far forward you'll have too much weight through your hands. Try to keep your weight over the bottom bracket, no matter what angle the bike is at. Practise this on flatter trails and think about which direction you need to move your body in to relieve the pressure through your hands.



MODE MATTERS

Practise a corner in different modes to see how this affects flow and control. Use 'Boost' sparingly – any pedal movement can make the bike jerk forward. Sometimes 'Eco' can be the best option, as well as saving battery life.

CORNERING

Good cornering technique is rewarded massively on an e-bike, but punished equally if you get things wrong because the heavier bike will stand up in turns more readily. Follow these tips for fast-flowing corner speed.

BRAKE EARLY

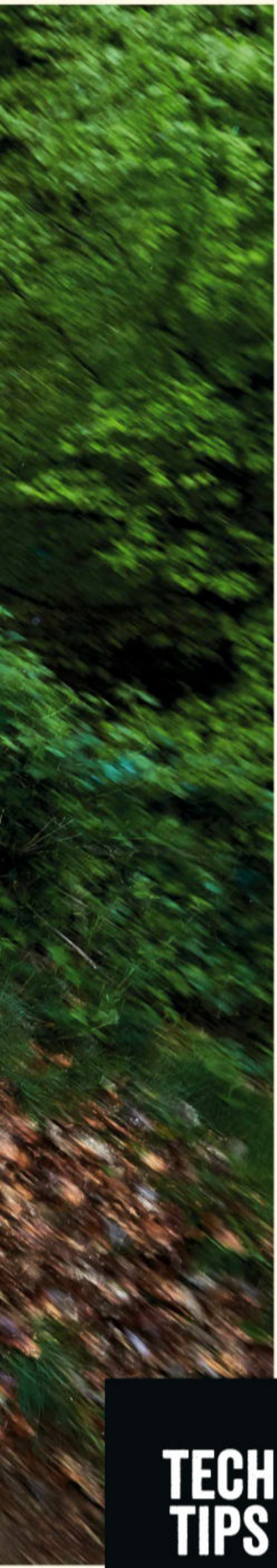
This will be sooner than on a regular bike.

VISION

Look through the corner and turn your chest and hips to point where you want to exit.

PEDAL POSITION

Don't automatically drop the outside pedal. This can put the bike off-balance if done too early or if riding through a banked corner. Keep the pedals level in these situations, and save dropping the outside pedal for flat or off-camber turns, where you'll lean the bike over and weight the outside pedal to make the tyres dig in.



ESSENTIAL E-BIKE SKILLS

TOP TIPS FOR ADAPTING YOUR TECHNIQUE AND GETTING THE MOST FROM YOUR MOTOR

E-bikes give a completely different perspective to a mountain bike ride. Providing the opportunity to explore further, tackle more technically challenging climbs, conserve energy or just keep up with other riders who are faster or more skilled, they're a great tool to help you enjoy your rides and broaden your horizons.

Maximising the benefits of the motor and using the weight that comes with this to your advantage requires a slightly modified approach, though. Good bike set-up will help, of course, plus there are specific technical skills to focus on to help you keep traction and improve control – so read on to find out how to rail the trails on your e-bike.

JUMPING

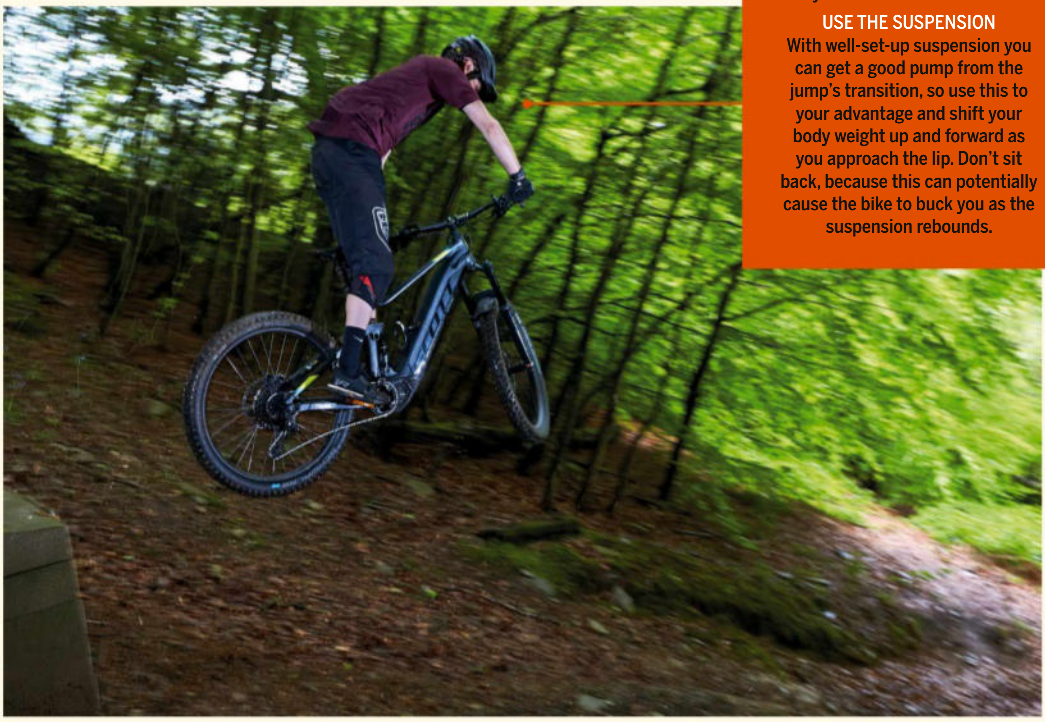
E-bikes are great for jumps, but good timing and correct body position are needed to stay in control.

SET A SUITABLE MODE

'Boost' will be too snatchy, 'Trail' is great for short run-ups, but 'Eco' may be best in some situations.

USE THE SUSPENSION

With well-set-up suspension you can get a good pump from the jump's transition, so use this to your advantage and shift your body weight up and forward as you approach the lip. Don't sit back, because this can potentially cause the bike to buck you as the suspension rebounds.



TECH TIPS

SUSPENSION

With the added weight and inertia of an e-bike, suspension is challenged more, so a poor set-up becomes a bigger hindrance.

Initial set-up Set the sag on the fork and shock (15-25% at the front and 20-30% at the rear is a good starting point) and keep a note of your air pressures. Also, make sure the suspension is balanced, front to back.

Tuning Most forks and shocks have a big range of usable rebound and compression damping adjustment. Air pressure should be your first go-to if things don't feel right, but e-bikes can be under-damped, so fitting volume spacers to resist bottom-out or adding low-speed compression to help with pumping can transform the ride.

CLIMBING

Climbing has never been so fun or rewarding as on an e-bike. Make the most of technical climbs and conquer seemingly impossible ascents.

BODY POSITION

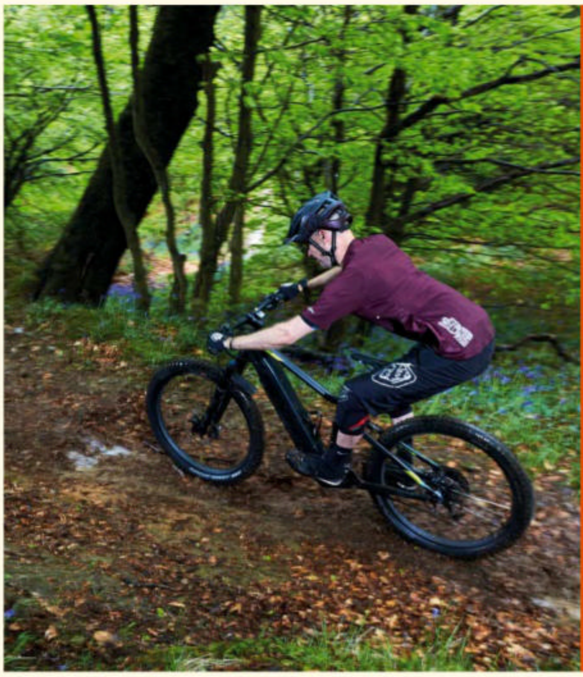
Because the rear wheel is motor-driven you need weight over it to make it grip rather than spin, but don't sit too far back or the front wheel will lift. Drop the saddle slightly below your full pedalling height to let you move around more easily and keep your weight balanced.

MODE AND GEAR

Select a suitable mode and gear for the terrain. Patience is key on e-bikes – climbing is most effective when done in an easy gear where the motor can assist you. Trust it to produce enough power and don't stomp down on the pedals.

PRACTICE

Technical climbs require practice to master, even with a motor. Accept that you may need to work on your uphill skills as you open up another side to your riding.



FLAT PEDAL THUNDER

If you use clipless pedals, now might be the time to try flats again. On an e-bike, the efficiency of being clipped in isn't as important, and flats promote better technique.

NO CHEATING

I often see people using clipless pedals to pull their bike up. With flats you have to learn to use proper technique for jumping, bunnyhopping, and so on, which will stand you in good stead.

BAD HABITS

Technical sections may instigate bad habits where you unclip early 'just in case'. The added confidence of flat pedals allows you to stay feet up, knowing you can quickly dab if things start to go south.

PATIENCE PAYS

Steep gradients and sharp climbs require you to attack on a trail bike, but on an e-bike it's better to take your time, use an easy gear and keep the cadence high. It may feel like you won't have the speed to reach the crest, but the motor will kick in most effectively and help with traction.

SPIN TO WIN

Gradual climbs on a regular trail bike can be attacked in a relatively hard gear with a grinding pedal stroke, but this approach isn't so effective on an e-bike. Less torque and more RPM through the pedals will really bring the motor alive.

MAXIMISE THE MODES

E-bikes can offer huge surges of power, which can help or hinder in different situations. Use the modes just like gears to suit the terrain and to maximise grip.

Terrain Let the terrain dictate the mode. Don't just leave the bike in 'Trail' all the time. Gradual climbs are tackled most effectively in 'Eco' for smooth power and economic battery use.

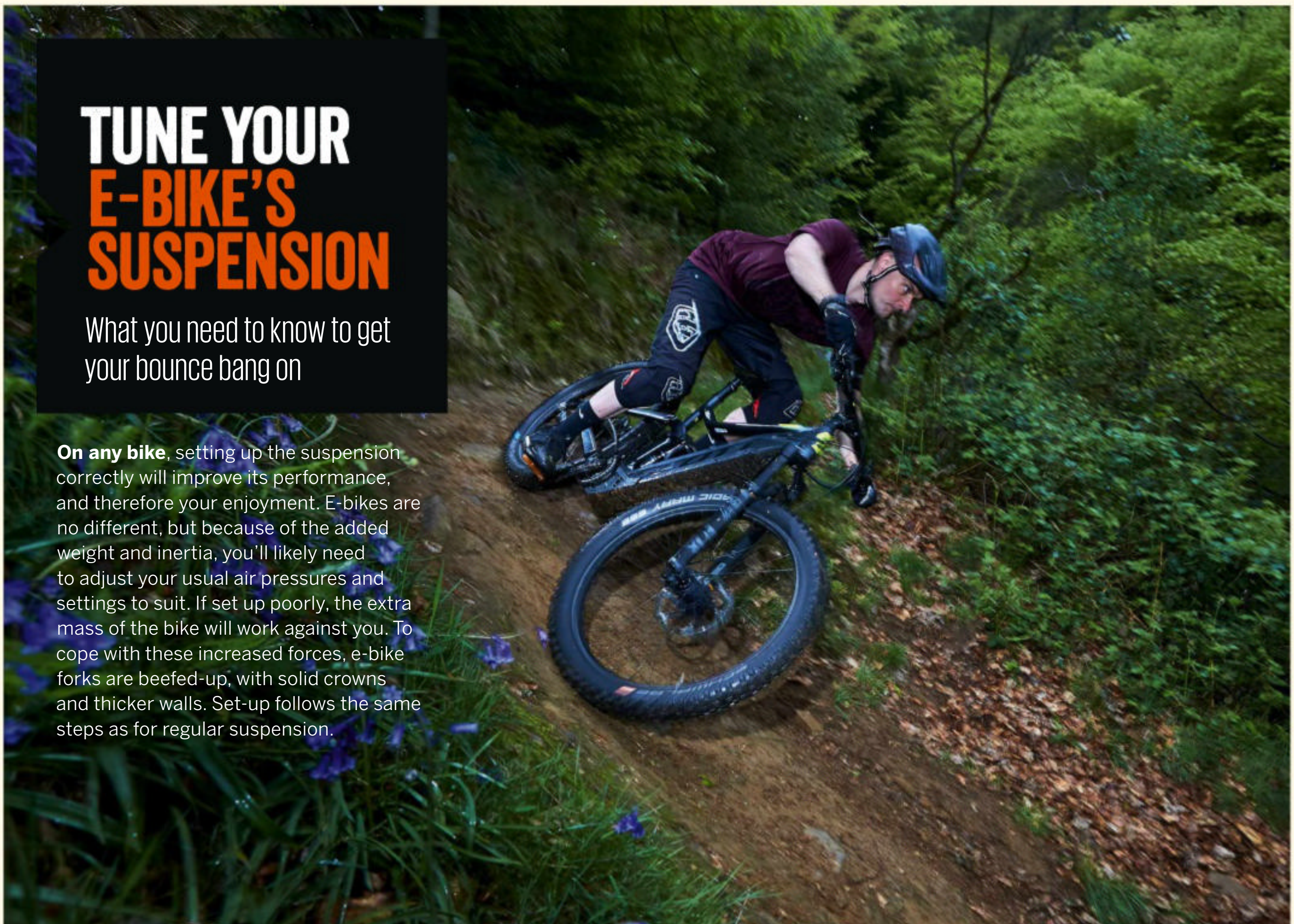
Practice 'Boost' mode ('Turbo' on Specialized bikes) can give you an injection of pace at the bottom of a bank, but if the ground is loose it's more likely to just make the back wheel spin out. Practise the same climb in different settings to see how this changes power delivery and how your gearing affects this.

INCREASE RIDE TIME

The addition of a motor can do more than just power you uphill like an uplift, it can allow you to ride longer distances and explore further afield. It just takes a change in mindset.

Go Eco 'Eco' mode doesn't mean less fun. Most people default to 'Trail' mode, but try 'Eco' and see how it changes the bike's power delivery.

Extend range Changing down a mode for the climbs won't just make for smoother power delivery and cadence, it'll save you energy and extend the range of your battery by a surprising amount. You'll then be able to burn those extra calories by extending your ride.



TUNE YOUR E-BIKE'S SUSPENSION

What you need to know to get your bounce bang on

On any bike, setting up the suspension correctly will improve its performance, and therefore your enjoyment. E-bikes are no different, but because of the added weight and inertia, you'll likely need to adjust your usual air pressures and settings to suit. If set up poorly, the extra mass of the bike will work against you. To cope with these increased forces, e-bike forks are beefed-up, with solid crowns and thicker walls. Set-up follows the same steps as for regular suspension.

INITIAL SET-UP IS KEY

Achieve the correct sag by adjusting the air pressure or spring rate. Only use any compression adjustment for fine-tuning. High-speed (HS) damping controls how the bike reacts to trail feedback (braking bumps, landings). Adding HS compression damping makes the suspension harder and reduces fork dive (which negatively affects handling on steep tracks under braking), but inhibits oil flow, so use it sparingly. Low-speed (LS) damping controls how the bike reacts to rider inputs (pumping, pedalling). Small increases in LS compression damping can help you carry speed. Set the rebound damping fast enough that the suspension doesn't 'pack down', but not so fast that the bike pings off obstacles.

SIMPLE SUSPENSION TUNING

Your e-bike will come set up to cater for a wide range of rider weights and riding styles, but there's an easy way to make it work better for you as an individual. If you find the fork or shock bottoming-out or diving too much, you can reduce the internal air volume to increase progression. This is done by adding volume spacers, so you can avoid increasing air pressure and sacrificing small-bump sensitivity. Similarly, if you find you're not getting full travel, think about removing a spacer. Changing the volume spacers in a fork or shock is easy and instructions are readily found on manufacturers' websites. It can be a simple, cheap and effective way to transform your e-bike's ride.

PROFESSIONAL REVALVE AND SERVICE

Some e-bikes come fitted with shocks that haven't been specifically tuned to handle the extra motor and battery weight, and if you buy an aftermarket damper, it likely won't have been optimised for your bike's specific leverage ratio. If you can't achieve an optimal set-up using the basic steps or you find yourself at the extremities of the external adjusters, then consider a professional revalve. Not only will a service centre be able to refresh the oil and seals and make them feel like new, they can also adjust the valves or shim-stack to suit. Let them know your weight, what bike you ride and your riding style, and they'll be able (within reason) to work miracles!

PRO-FILE

ALAN MILWAY

JOB Professional MTB coach

CREDENTIALS Alan Milway has more than 13 years of experience training some of the world's best racers. He's also part of the holistic coaching brand +3 MTB, so while he has the knowledge to train those operating at the highest level, he understands the needs of everyday riders too.

GET MORE FROM YOUR E-BIKE

MTB coach **Alan Milway** explains how to get your set-up dialled

E-bikes bring another dimension to a mountain bike ride. While they may look very similar to normal trail bikes – albeit with a heavy battery, a motor and generally wider tyres – they require a different approach to set-up in order to maximise performance and get more than just a boost up the hills.

SET YOUR SAG

Taking time to properly set up your suspension is vital. With the bike being heavier than a regular trail bike, your fork and shock will probably require more air pressure to achieve the correct sag. Have a friend help while you stand up on the bike, and measure the sag on the fork and shock. Aim for between 15 and 25 per cent at the front, and 20 to 30 per cent at the rear, to start with. Consider adding volume spacers or compression adjustment if you're still bottoming out the fork and/or shock.

SCHWALBE
XT
2FO

SORT THE SUSPENSION

Some e-bikes will benefit from a suspension re-valve, to increase the amount of compression damping available. This will help support the added weight of the bike and stop the fork diving through its travel. While this work should be done by a suspension expert, it can really improve the handling and control of an e-bike – especially on descents.

CHECK THE BRAKES

With their increased stability and grip – due to their heavier weight and low centre of gravity – e-bikes can feel amazing on fast downhills, but it's easy to overshoot corners due to the increased inertia. They generally have large rear brake rotors to help slow them down, so ensure the brakes are working well, and monitor pad and rotor wear. Poor brake performance will ruin an e-bike ride, so take the time to bleed them when the levers start to feel spongy.

UP YOUR TYRE PRESSURES

E-bikes generally have larger-volume tyres that need higher pressures to prevent them from feeling vague or rolling on the rim when loaded hard into corners. In fast sections, it can feel as though they're 'folding' under the bike if run too soft (or at your 'normal' trail bike pressures). The levels of grip they offer when set-up well is huge though. To start with, aim to increase the pressures by 5psi over your standard set-up. Make adjustments both up and down in pressure to see how it affects performance.

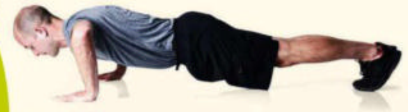
FITNESS & TRAINING

GET BIKE FIT QUICK

Here's a range of easy ways to get yourself in better shape

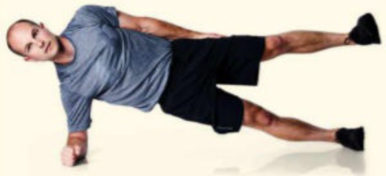
MAKE GAINS OFF THE BIKE!

The fastest and most effective way to get bike fit is to ride as hard as possible as often as possible, with recovery periods in between. But you can't always do that, so here's a selection of bike-free exercises that can shortcut and complement strength and fitness gains.



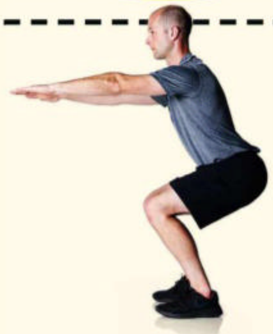
PRESS-UP

If you struggle on rough ground or long descents, it could be due to a weak upper body. With your hands just outside shoulder width, keep your body straight and extend your arms, pivoting from your toes. Lower yourself back down until your upper arms are parallel with the floor.



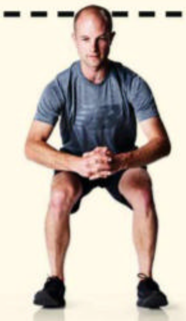
SIDE BRIDGE WITH LEG RAISE

Want a torso and glutes of steel? This is the one for you. Start by supporting yourself on your elbow and foot, straight and strong from head to heel. Then draw in a deep breath, fill your belly and, as you exhale, lift your top leg as high as you can.



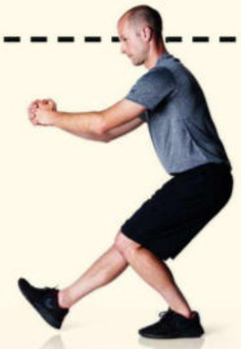
SQUAT

With feet just over shoulder width apart and chest upright, ease your hips down as if sitting on a chair until your thighs are parallel with the floor. Push back up slowly.



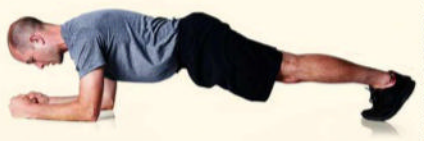
BUNNYHOP

Stand in a jump position, engage your core, sink to a quarter-squat, then push up through the balls of your feet with max force. Absorb and control the landing.



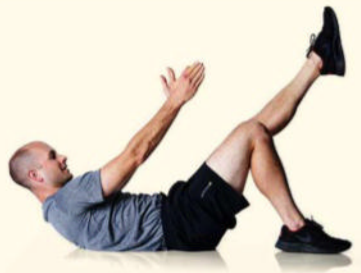
ONE-LEG SQUAT

Stand on one leg with the other leg slightly in front and off the floor. Keep your chest upright and core engaged, and bend the supporting leg, keeping the other straight.



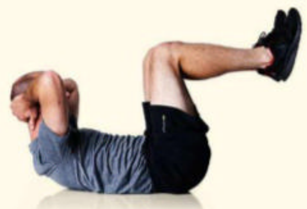
PLANK

With your feet as close together as possible, and only your toes and forearms in contact with the floor, hold the rest of your body off the ground, in a straight line.



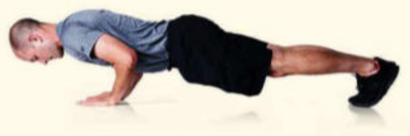
'V' SIT-UP

Lie flat, with both of your hands above your head. Sit up and raise one leg straight up so that you touch your ankle with both hands. Repeat with the other leg.



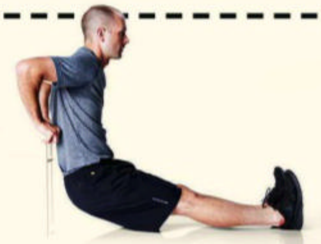
CRUNCH

Raise your feet, with hips and knees at 90 degrees. With fingers on head, chin tucked in and legs still, engage your core muscles to bring your elbows to your knees.



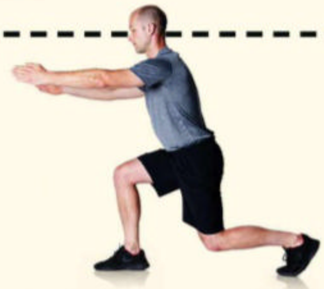
CLOSE-ARM PRESS-UP

Put your hands under the centre of your chest. Keep your body straight and extend your arms, pivoting from your toes. Lower yourself back down until your chest touches your hands.



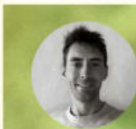
DIP

Put your hands on a step or a low table, with your fingers facing forwards. Bend at the elbows, lowering your body, back straight and chest upright. Bend your elbows to 90 degrees and then return.



LUNGE

Standing tall, with your shoulders back and core engaged, step forward and lower your body, under control, until both knees are flexed to 90 degrees, then return to the start position. Repeat on the other leg.

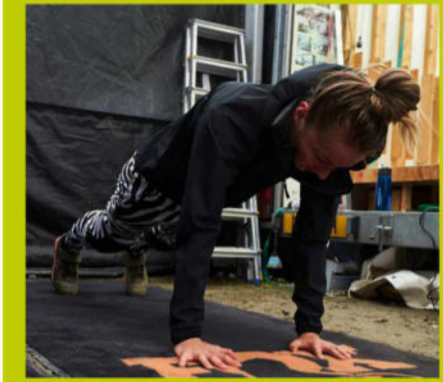


CHRIS
KILMURRAY

WARM UP LIKE A WORLD CUP WINNER

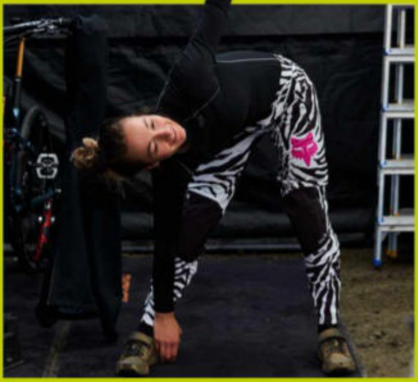
Follow Tahnée Seagrave's pre-race routine to ride faster

We're as guilty as anyone of not bothering to warm up properly before rides, but for top-tier racers like Tahnée Seagrave, limbering up can unlock those vital milliseconds between a win and second place. A strict warm-up routine is doubly important in case things go wrong, where having better mobility to deal with crashes could mean being back on the podium the following weekend rather than sidelined with injury. Here, Tahnée's coach **Chris Kilmurray** shares her pre-ride routine with us. Get into the habit of following this and you're guaranteed to notice improvements on the bike. It's a few minutes well spent.



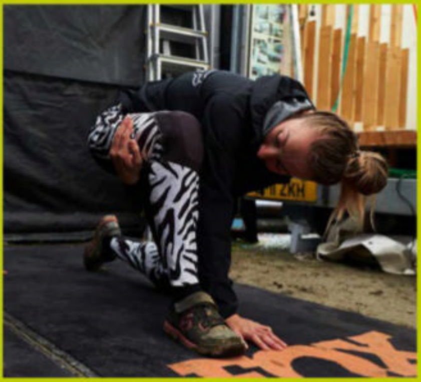
01
PUSH-UP 'PLUS'

This is a strength-training move that transfers perfectly to warming up. Perform a standard push-up, with your chin tucked in and arms at a comfortable width and angle away from your torso. Slowly lower your chest to the floor, maintaining tension from head to toes throughout, which is key to this movement's effectiveness. The 'plus' comes from actively pushing away from the ground at the top of each repetition. This scoops your shoulder blades around your rib cage and activates all the smaller muscles that help keep your shoulders stable and safe. Go for 6-12 repetitions depending on your strength, and try not to hold your breath.



02
WINDMILL

By mobilising your hips laterally, this simple exercise gets your upper back and torso primed for hitting those first turns on the trail. Not only does the windmill feel good, but if done well it develops upper back and neck mobility that'll allow you to shred the tightest turns on any track with ease. Start standing tall and relaxed, legs over shoulder-width apart. Push your hips into your left pocket, keeping your legs straight. When you can't push any more, slowly slide your right hand down the inside of your right leg while simultaneously reaching up to the sky with your left hand, all the while following your left hand with your eyes. Move back to centre, slowly and with control, and repeat on the other side. Repeat 10 times on each side for happy hips.

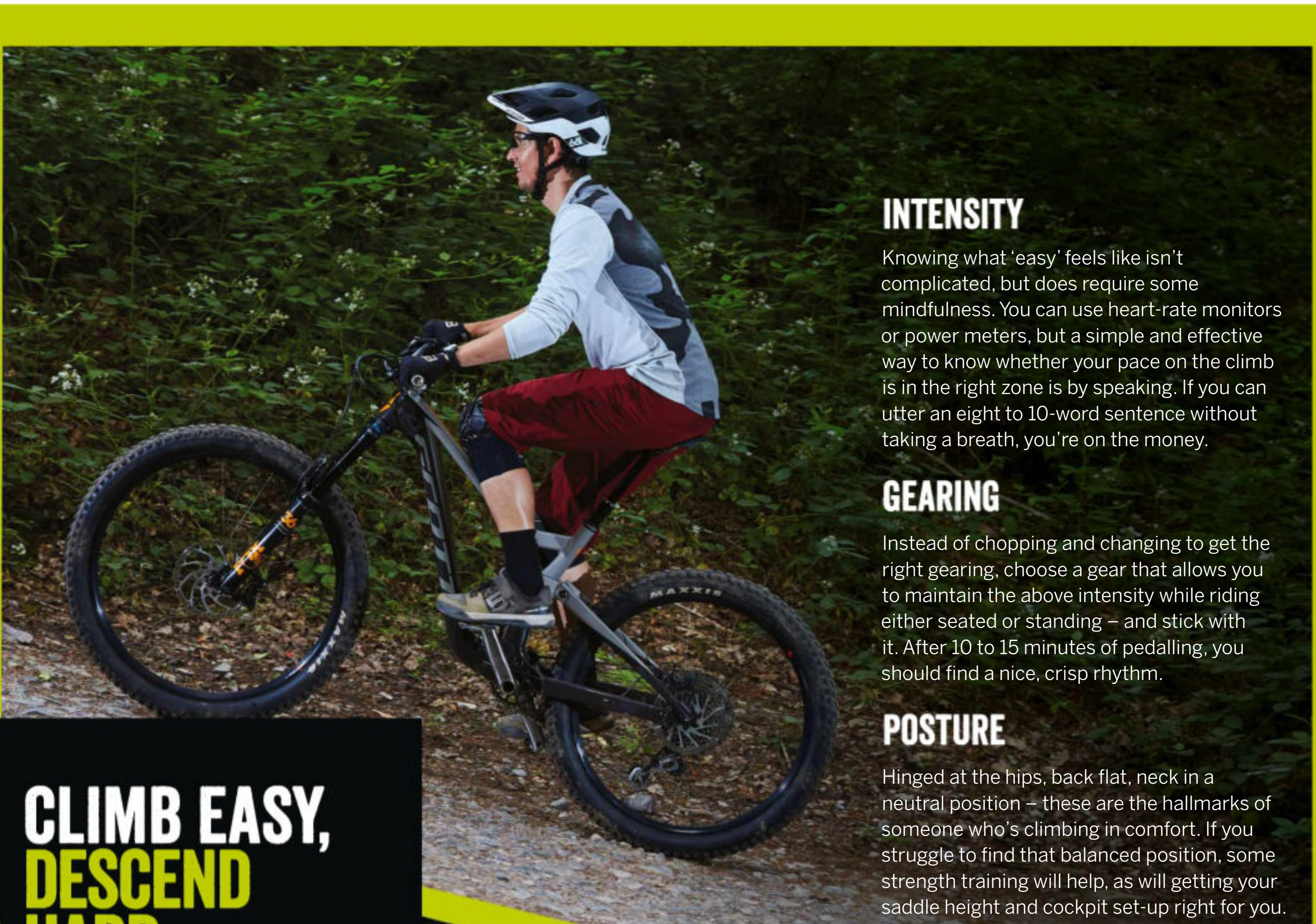


03
HALF-KNEELING SCOOP TO REACH

Mobility in your mid-back is a critical component of bike control, especially when getting wild or slinging it between berms. It also contributes to better shoulder mobility at the end of your range of motion, meaning less chance of injury in a crash. Start in a half-kneeling position with your front foot flat and back foot on your toes. Try to keep everything 'square', with a 90-degree angle between the knee and hip of the front leg. Starting with the right foot in front, scoop through underneath your right thigh with your left hand, as far as you can reach. From there, exhale and slowly move your hand out and reach up towards the sky. Repeat 6-10 times on each side, aiming for smooth and mindful movements.

CLIMB EASY, DESCEND HARD

Conserve energy on the ups so you can hammer the downs



INTENSITY

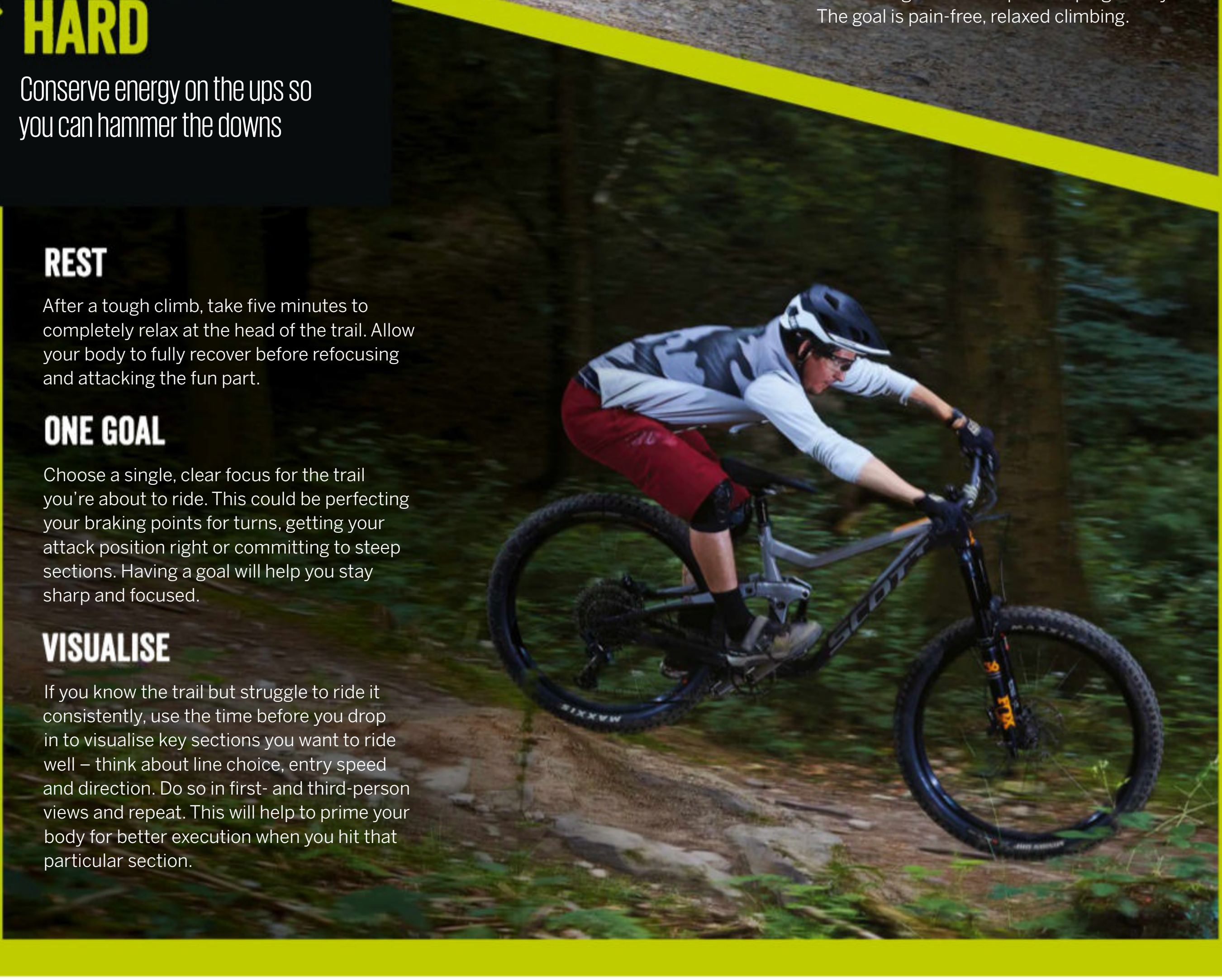
Knowing what 'easy' feels like isn't complicated, but does require some mindfulness. You can use heart-rate monitors or power meters, but a simple and effective way to know whether your pace on the climb is in the right zone is by speaking. If you can utter an eight to 10-word sentence without taking a breath, you're on the money.

GEARING

Instead of chopping and changing to get the right gearing, choose a gear that allows you to maintain the above intensity while riding either seated or standing – and stick with it. After 10 to 15 minutes of pedalling, you should find a nice, crisp rhythm.

POSTURE

Hinged at the hips, back flat, neck in a neutral position – these are the hallmarks of someone who's climbing in comfort. If you struggle to find that balanced position, some strength training will help, as will getting your saddle height and cockpit set-up right for you. The goal is pain-free, relaxed climbing.



REST

After a tough climb, take five minutes to completely relax at the head of the trail. Allow your body to fully recover before refocusing and attacking the fun part.

ONE GOAL

Choose a single, clear focus for the trail you're about to ride. This could be perfecting your braking points for turns, getting your attack position right or committing to steep sections. Having a goal will help you stay sharp and focused.

VISUALISE

If you know the trail but struggle to ride it consistently, use the time before you drop in to visualise key sections you want to ride well – think about line choice, entry speed and direction. Do so in first- and third-person views and repeat. This will help to prime your body for better execution when you hit that particular section.

ARM PUMP: DON'T FEAR IT, FIX IT!

How to avoid pain and cramps on long and rough descents

'Arm pump' is a catch-all term for problems that affect mountain bikers' arms, wrists and hands on prolonged descents, especially over rough terrain. It hits hard and fast and has many symptoms – from rock-solid forearms to talon-like fingers that you have to peel off the bar, or hand cramps that make medieval torture techniques look like child's play – but no single, irrefutable cause. Here are a few things you can do to help stop it ruining your fun on the downhills.

RIDING FIXES

Improving your riding position can help reduce arm pump. There's no perfect template to try to fit yourself to. It all comes down to the relationship between your strength, limb lengths and skill set. The aim is to distribute your weight in such a way that you can 'float' over rough terrain and use less energy doing so. Instead of trying to stick to a rigid idea of a perfect posture, embrace the fact that you must be adaptable and supple on the trail. Keep your head up, as if you expect to catch a ball at any second. Imagine that the front half of your foot is on a springy diving board. Search for trail features that'll allow you to either stay smooth or generate speed.

PRO-FILE

CHRIS KILMURRAY

JOB Coach at Point1 Athletic Development

CREDENTIALS After racing national and World Cup level downhill from a young age, Chris now coaches riders including Tahnée Seagrave and Greg Callaghan.

SET-UP FIXES

From a biomechanical perspective, changing your cockpit set-up can reduce the likelihood of 'hurty' arms.

Bar width – Wider handlebars can give you more stability on the bike, but only if your shoulders remain stable. The wider your bar, the further your upper arms will be from your torso when riding. This demands a lot from your shoulder muscles. Hold your bar while standing – if its width makes your shoulder blades come together, it's too wide.

Grip diameter – Go as narrow as comfort allows. This means your forearm muscles (which bend your fingers) will have more 'range' to use. Grip on the bar should be dynamic – don't take a 'set and forget' or 'hold on for dear life' approach!

Bar roll and brake lever angle – These two go together. Bar roll is all about distributing your weight between the bike's front and rear wheels. Lever angle should be a happy medium, so that on flatter trails you have a stable bend in the wrist and when things get really steep your wrists never go beyond level. If you have to reach down for your brake levers, you lose grip strength.

TRAINING FIXES

Strength in the right places will reduce the load on your hands and arms, making pain and cramp less likely

Grip strength

Use moves in the gym that directly target grip strength – heavy deadlifts, pull-ups and farmer's walks are great for this. You want to build strength in the muscles that flex the fingers, wrist and turn your forearm in and out, so try TRX rows too.

Hip strength

Stronger hips and legs mean you can support more weight through your lower body, so your arms do less work. Romanian deadlifts, hip thrusts and the almighty kettlebell swing are brilliant here. The KB swing works dynamic grip strength too – double whammy!

T-spine mobility

Having a mobile upper back, in all planes of motion, means you'll have happier shoulders. Healthy, stable and mobile shoulders can support more of your mass when hitting big holes, meaning your arms and hands do less. Take up a half kneeling position, where your back foot touches a wall behind you, with your left leg in front. From there, reach around to your right and tap the wall, keeping a straight spine. Swap sides and legs. Repeat for 10 reps each side.

USE DUMBBELLS FOR A QUICK WINTER WORKOUT

Two fuss-free sessions - all you need is a pair of dumbbells

Not enough time? Family commitments? Dark mornings, short days? Excuses are a dime a dozen… Here are two training sessions you can bust out in no time, on your own or with friends, that are guaranteed to improve your strength, stamina and posture on the bike.

Session 1 – Horsepower

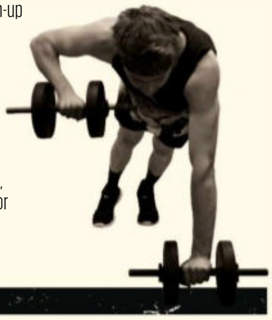
Go for heavier dumbbells - 3 sets of 5-8 reps per exercise per group. Rest 2mins between exercises and 3mins between groups.

Session 2 – Endurance

Use lighter dumbbells - 4 sets of 10 reps per exercise per group. Rest 1min between exercises and 2mins between groups.

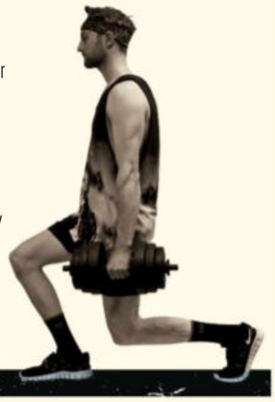
RENEGADE ROWS

With the dumbbells (DBs) stable on the floor directly under your shoulders, start this move at the top of the push-up position. Driving into the right hand, smoothly row the left DB back up. It's crucial to maintain stable posture - no twisting or rotating. Repeat on both sides, and alternate sides for maximum effect.



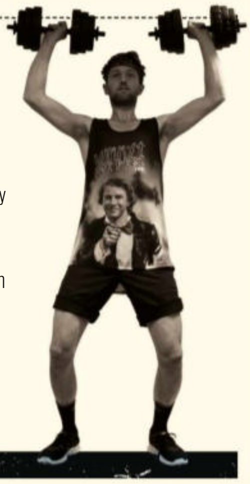
FORWARD LUNGE

With the DBs at your sides, step forward and plant your foot firmly but silently on the floor - your shin should only have a slight angle. Drive into the floor with the front foot, finishing with a strong push back to your start position. Repeat on alternating sides and pay attention to how hard you push away each rep and how stable and solid your posture is.



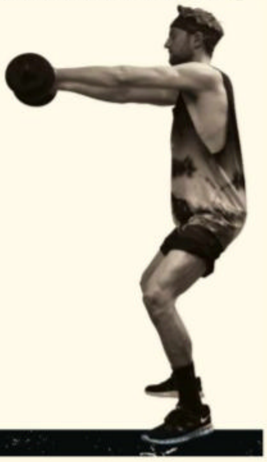
CHEAT PRESS +

With the DBs racked in front of your shoulders, dip down into a quarter squat, loading up your glute muscles. From there explode up, simultaneously pushing the DBs over your head. Finish the move on your toes then come back softly to your start position and repeat for reps. Intent to move fast is key.



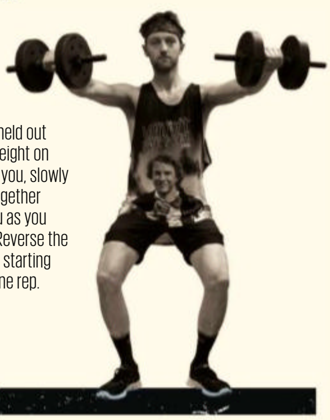
SWINGS

This move requires only one DB. Starting with it held with both hands between your legs, aim to snap it up to just above chest height so your arms are parallel to the floor. Do this by hinging your hips back and snapping through. Think: straight legs, quick punch - and solid core.



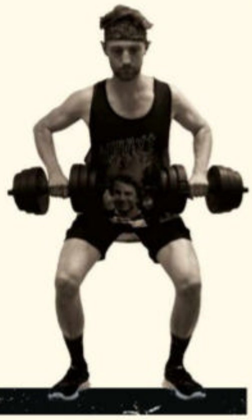
IRON CROSS

Make your DBs lighter for this exercise. Standing tall, with the DBs held out at shoulder height on either side of you, slowly bring them together in front of you as you squat down. Reverse the move back to starting position for one rep.



RDL TO ROWS

A combo move to finish you off. Hinge your hips back, knees just a little bent, while simultaneously lowering your DBs to below knee level. From there, row your DBs back. Once you finish your row, drive your torso tall and straight back to your starting position, using your glutes. Reset and repeat for reps.



FORGET THE TURBO! SHORT RIDES FOR MAXIMUM GAINS

For some, no matter how grim the weather, the turbo trainer is never the answer. If that's you, here are three essential short training rides

1 PUMP IT UP

Pumping is fun and an essential trail skill. When done to generate maximum speed, it's also very tiring. If you live near a pump track you're in luck, but we're not all so blessed. Instead try 'pump only' rides at your local trails. That's right, no pedalling allowed! Choose a descending section of trail and aim to pump hard and fast at all opportunities - backsides of rollers, jumps, corners and off-cambers. This can make a short ride really fun and productive.

2 PEDAL POWER

Trails often call for short, repeated bursts of pedalling to get over obstacles, which riders can struggle with from a coordination and execution standpoint. To improve, you need to train. Start with a simple turn on gravel or dirt, not a berm. Set a start point that allows you to hammer 10 to 12 pedal strokes before the corner, then on exiting the turn aim to hammer out 10 to 12. Do this in both directions, working on gear selection, braking points, vision and timing of your pedalling efforts. You can make it a 'repeat sprint' training session by timing the rest interval between each run.

3 TURBO WARM-UP

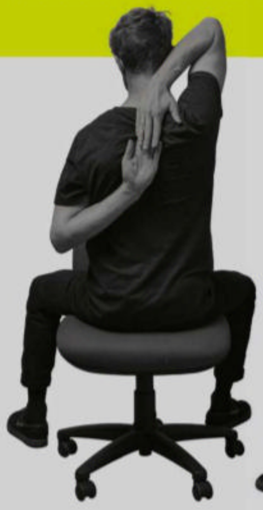
This may seem like cheating, but using your turbo set-up at home to get a good warm-up before you hit the trails or roads is a classic tool used by professionals. If the trails are a long drive away, it may not be practical, but for those lucky enough to live near good riding, try a 15-minute turbo warm-up with 3 x 5sec sprints and 1 x 1min 'build' to a high intensity before you leave the house. This will make the hardest part of riding in winter - getting warm - much easier.

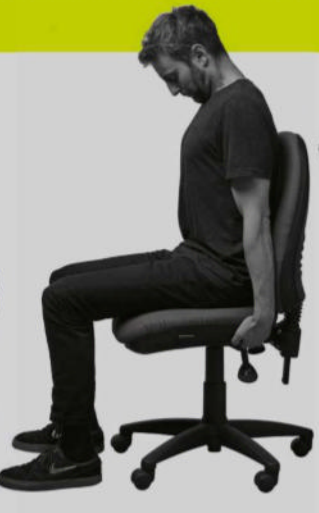
STAY MOBILE IN YOUR OFFICE JOB

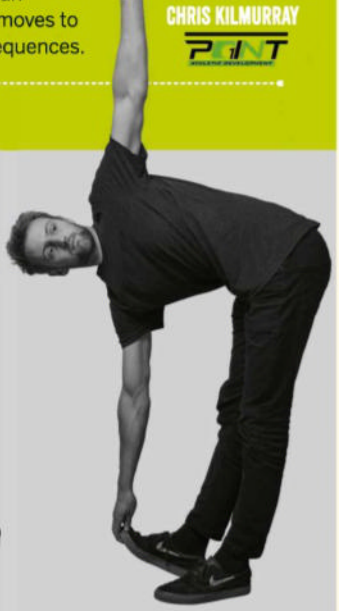
Daily moves for the deskbound mountain biker

You've heard it 100 times before – sitting is bad for you, your sedentary office job will kill you and so on. The real culprit is time. Hours accumulated at your desk can cause issues with mobility, flexibility and strength, from your ankles right up to your neck. All of which can impact your fun, speed and safety on the trail. Here are three moves to do daily at your desk to help you avoid sitting's negative consequences.

CHRIS KILMURRAY







1 **Cow arms**
Borrowed from yoga, this is a simple (but not easy) move for the shoulders and upper back. One hand goes up and over your head then behind your back, the other slides under your shoulder blade to clasp the other hand in the centre of your back. Hold for 30 to 60 seconds before swapping sides.

2 **Butt-grab chin nods**
Grasp the bottom of your chair, as far back under your bum as you can, and push in as hard as possible for three seconds. As you do this, you should be sitting tall and relaxed. At the same time, make a double chin by pulling your neck down and back. Do this for 10 to 30 reps. Happy neck and shoulders to follow!

3 **The all-in-one**
From a standing position, sit back into your hips and rock onto your right heel with the other foot flat. Reach down with your right hand and touch your right foot, twisting your torso and looking up to your other hand as you reach for the sky. Hold this for three seconds and repeat for 10 reps.

-BOOT CAMP-

FUEL YOUR RIDES THE RIGHT WAY

What to eat and drink to stay energised and recover faster.

BEFORE

Start with a hearty and balanced breakfast. A big plate of toast, eggs, avocado and bacon will give you a good mix of carbs for energy plus fats and protein to keep you fuller for longer. Oats are a great quick alternative. Cook up porridge in the morning or save time by soaking them in milk overnight. Top with nuts, seeds or berries. Avoid sugary cereals, which will give a spike of energy but leave you hungry by the time you get to the trails.

MID RIDE

Exercise can suppress the appetite, so you may only realise you need food when the dreaded bonk hits you (when your blood sugar falls too low and you feel like jelly). Avoid this by eating little and often. Cereal bars, bananas, trail mix and homemade flapjacks are all good. Don't stuff your lunchtime sandwiches down in one go, because digesting all this food at once will leave you feeling lethargic. Keep up your fluid intake throughout the ride.

POST RIDE

After intense exercise, your glycogen stores will be depleted and your muscles sore. Your body is most receptive to food within 30 minutes of finishing, and the perfect recovery food is a 2:1:1 mix of carbs, sugar and protein. Shop-bought recovery shakes tend to be expensive and rammed full of sweeteners. Instead, try a nut butter sandwich loaded up with honey or jam and a banana.

STAY MOTIVATED

Change your ride habits to have more fun and get fitter

01 BOOST YOUR RIDE LENGTHS

We all have a favourite loop and it's easy to stick to that route every time you head out for a regular midweek ride, doing it on repeat. Although, in the first place, that's a great thing to be doing, you're missing out on something called volume progression – basically, increasing the duration of your ride from, say, 60 minutes to 90 minutes, to cause an increase in workload that stimulates physical developments. So think about how you can extend your favourite loop slightly. Progressively adding a mile or so, or incorporating tougher climbs, will give you big improvements in all the right departments.

02 CHALLENGE YOURSELF

Take a leaf out of the Athertons' book. They have stretches of road and trails that Rachel, Gee and Dan have set benchmark times on, so they know how long it should take them to ride. The challenge they set themselves is to go as hard as they can, each time they ride those sections, to try and beat their times. On your regular loop, set at least one segment where you have to step up your effort. This increases the metabolic demand of the ride and is a great way to build up your fitness.

03 THE DREADED 'S' WORD

Strava. There, we've said it. Many of us use the app – we love it, hate it, have been fascinated by it and spent many afternoons on our bikes, riding as hard as we could, to try and take all the local KOMs. If you pick and choose your times to use it, and forget about the fact that you're 135th on a stage you didn't realise you were even riding, then Strava can be a good tool to motivate you to push up that climb, even as your thighs are screaming.

04 GET YOUR RACE HEAD ON

If you regularly head out with a group of riders, or even just a couple of mates, try including some mini races within your trails, like you did when you were a kid. Last one to the finish buys the low calorie beers – not too many though, you're supposed to be getting in shape! A mix of short, sharp sprints, longer drags and technical sections will show who's the powerhouse, who's the whippet and who's got the skills. It genuinely builds fitness and motivation – plus it's damn good fun.

05 NASTY HILLS

It might sound like we're trying to make your life miserable here, but seriously, we're not! Deliberately put the hardest climbs you can into a ride and make them a regular challenge. Preferably hit them as hard as possible, and allow yourself recovery time when you've conquered the hill. Just think how good you'll feel at the top! You'll also notice how they become easier over time, as both your fitness and climbing technique improve.

06 TWO BIRDS, ONE STONE

Riding to work is one of the best ways to get in some serious bike time, without even thinking about it. We know a 40-year-old triathlete who's in amazing shape. He bases the vast majority of his training around his commute to work, which is eight miles in each direction. That shows it's possible to get into good shape even with a busy life. You could try riding to work once a week, riding into work and taking the train home, or driving halfway and riding the rest – whatever works for you.

07 TYRE CHANGES

If you regularly ride to work, especially if the route is mostly on tarmac roads or cycle paths, is your bike set up as well as it could be? Think about the basics – saddle height, suspension lockout, tyre pressures and even the rubber itself. A pair of slicks can turn a chore of a hill into a breeze – or if you're going after the burn, try using under-inflated knobbly tyres. These are only for masochists who want some extra resistance training, though!

08 HUNTING ROADIES

Not to be rude to our shaven-legged comrades, but try using them as a benchmark. If you normally ride steadily during your commute, up the intensity for parts of the ride. If you see a road cyclist up ahead, can you catch them? We know a guy who used to ride a BMX into Birmingham and try to sprint past anyone he saw – he said the look on their faces was worth it! And his sprint and anaerobic power increased markedly in just a few weeks.

Don't avoid tough climbs – they can provide a big training boost

MIND OVER MATTER

Keys to a positive mental attitude

SET YOUR SIGHTS

Think of an event you wish to do, a route you want to ride or a trail you'd like to conquer, then set some goals and make a plan to get you there. Goals can be as big or as little as you like and achieving them will do wonders for your self-esteem and confidence, both on and off the bike.

OVERCOME ANY CHALLENGE

We all take that 'chicken run' every now and again or look at an obstacle and admit defeat without even attempting it. Next time, approach it differently. Try breaking the obstacle down into manageable sections. Then go away and practise each part on a smaller scale so that you're ready to nail it next time.

LEAVE YOUR COMFORT ZONE

Push yourself – it's good for the soul and it's fun! Get out there and join a group ride or find a couple of buddies who'll push you along. You'll soon forget how hard that climb was or how far you were behind your mate, and you'll be setting your sights on a fresh challenge.

PREPARE FOR YOUR NEXT RACE

Atherton Racing coach **Alan Milway** explains the basics – plus how to push limits like Gee

Racing mountain bikes is as exciting as it is nerve-wracking, giving you the opportunity to push body and bike to the limit, whether it's a local enduro race or a DH World Cup. Although competing against the clock can be a way to make a living for some, for most it's done for the enjoyment and camaraderie that comes from being with friends and challenging yourself while having fun. This being said, we all want to leave the track feeling that we've given our best and are satisfied with our performance, regardless of where we are on the time sheet.

During winter, pro riders spend their months preparing hard for the racing to comen during the spring and summer, and there are many lessons we can learn from their prep. As coach to Gee Atherton and Charlie Hatton of Atherton Racing, among others, I know the best ways to prepare for any race – as well as the steps these guys and riders like them take to really push their limits.

> RE-RIDE SECTIONS. TOO MANY PEOPLE MESS UP A CORNER AND DON'T RETURN TO FIND OUT WHY

PRO-FILE

ALAN MILWAY

JOB Atherton Racing coach

CREDENTIALS Alan Milway has more than 13 years of experience training some of the world's best racers. He's also part of the holistic coaching brand +3 MTB, so while he has the knowledge to train those operating at the highest level, he understands the needs of everyday riders, too.

1. TECHNICAL DEVELOPMENT

The number one way to improve your results in a technical discipline such as enduro or downhill is to work on key skills. From body position to cornering, riding rocks and roots to line choice, if you want to get better at these elements you need to practise – a lot. Choose a skill to improve on a ride and repeat sections, analyse yourself and reflect on your riding. Are you braking too late into the corners? Are you looking through the turn or at your front wheel? Do you find yourself losing speed on a specific section of trail? Deliberate practice is important, and so is variation. This helps skill development, so changing tracks and terrain will help make you a more rounded rider.

THE PRO APPROACH

Regular weekly riding is all part of the job for racers on the World Cup circuit, often on private uplift days and with other pros, so the learning is constant. There's also frequent feedback, through watching GoPro footage and videos of their riding, and learning from the group. Having a selection of bikes to ride – trials motorbikes, hardtails and trail bikes as well as DH/enduro bikes – keeps things fresh and varied, and maintains pro riders' skills development and progression.

KEY POINTS

- PRACTISE REGULARLY, EVEN IF IT'S FOR SHORT PERIODS, OR ON A SPECIFIC SKILL, SUCH AS MANUALLING
- RE-RIDE SECTIONS. TOO MANY PEOPLE MESS UP A CORNER AND DON'T RETURN TO FIND OUT WHY
- CROSS-TRAINING HELPS DEVELOP SKILLS – PUMP TRACK, TRIALS, MOTOCROSS, ETC

2. PHYSICAL TRAINING

Fitness is a measure of how well your body is adapted to its environment. So, training should suit the discipline you're doing it for. In the case of mountain bike racing, it should allow you to focus on the fun of the riding as well as maximising performance. A week of sitting behind a steering wheel or desk won't help you improve on a long, physical enduro race, so if you want to see improvements, adding regular, manageable training into your week will pay dividends. It doesn't have to be a huge commitment, and frequency is better than volume, so short sessions still work. Understand where your strengths and weaknesses lie, and what your discipline requires, as you want to see your efforts translate onto the bike and reap the rewards.

THE PRO APPROACH

Because it's a key aspect of their job, pro riders like Gee (pictured) train for many hours each week, often two sessions per day. I'm at the team HQ weekly for coached gym sessions and to write training plans for the riders to follow in their daily training, to improve strength, power and aerobic endurance, to suit their particular discipline.

KEY POINTS

- TRAINING DURING THE WEEK WILL IMPROVE PERFORMANCE AT THE WEEKEND
- CARDIO TRAINING WILL MAKE THE BIGGEST DIFFERENCE TO ENDURANCE ON THE BIKE
- FREQUENCY IS BETTER THAN VOLUME – SESSIONS DON'T HAVE TO LAST FOR HOURS
- SET A ROUTINE THAT WORKS FOR YOU. A MANAGEABLE SCHEDULE IS KEY, AND SOMETHING YOU CAN STICK TO IS VITAL FOR PROGRESSION

> FREQUENCY IS BETTER THAN VOLUME – SESSIONS DON'T HAVE TO LAST FOR HOURS

3. BIKE SET-UP

Many riders spend thousands on their bikes and invest in the best kit to give themselves an advantage or the best possible chance of going fast. However, good bike set-up is crucial, and often overlooked. The bike needs to work with you, not against you. I have a lot of experience helping amateur riders through my coaching, and often see set-up issues – rear shocks that are too soft, tyre pressures that are overly hard or way too low, bars that are overly high. Invest time in adjusting your bike and tinkering with different set-ups. Set up the suspension for your weight but also the terrain, because the manufacturer's recommended settings won't necessarily translate to optimum performance on the trails you're riding. Finding the right tyre and suspension pressures will make a huge difference. Regular servicing and maintenance will also pay off – even simple measures such as oiling the chain can save watts, leaving you with more energy.

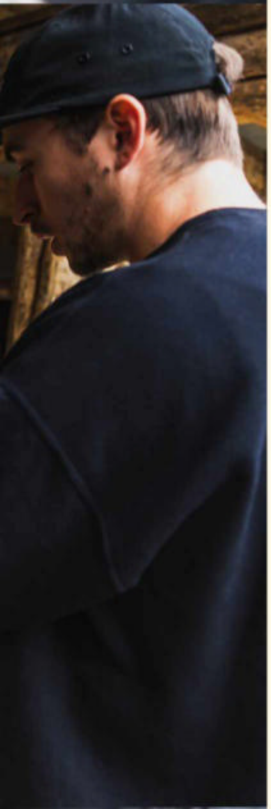
THE PRO APPROACH

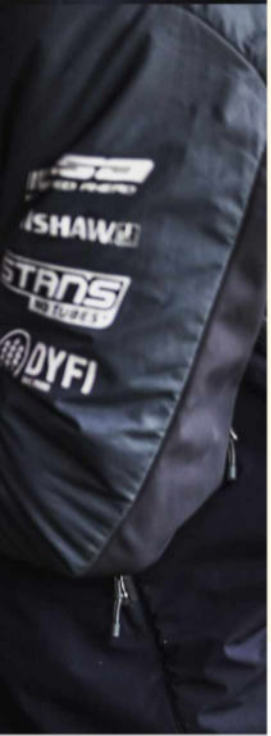
Bike set-up is a process of constant refinement. Regular testing days are held with mechanics on hand to make adjustments, try new components or set-ups, and feed back on performance improvements. Fox host test camps to get the riders comfortable on their latest suspension products. The Athertons are now making their own frames, so can build new parts to try back-to-back and assess. I'll often be on hand to time, film or help compare set-ups, as a bike that feels slower may actually be much faster.

KEY POINTS

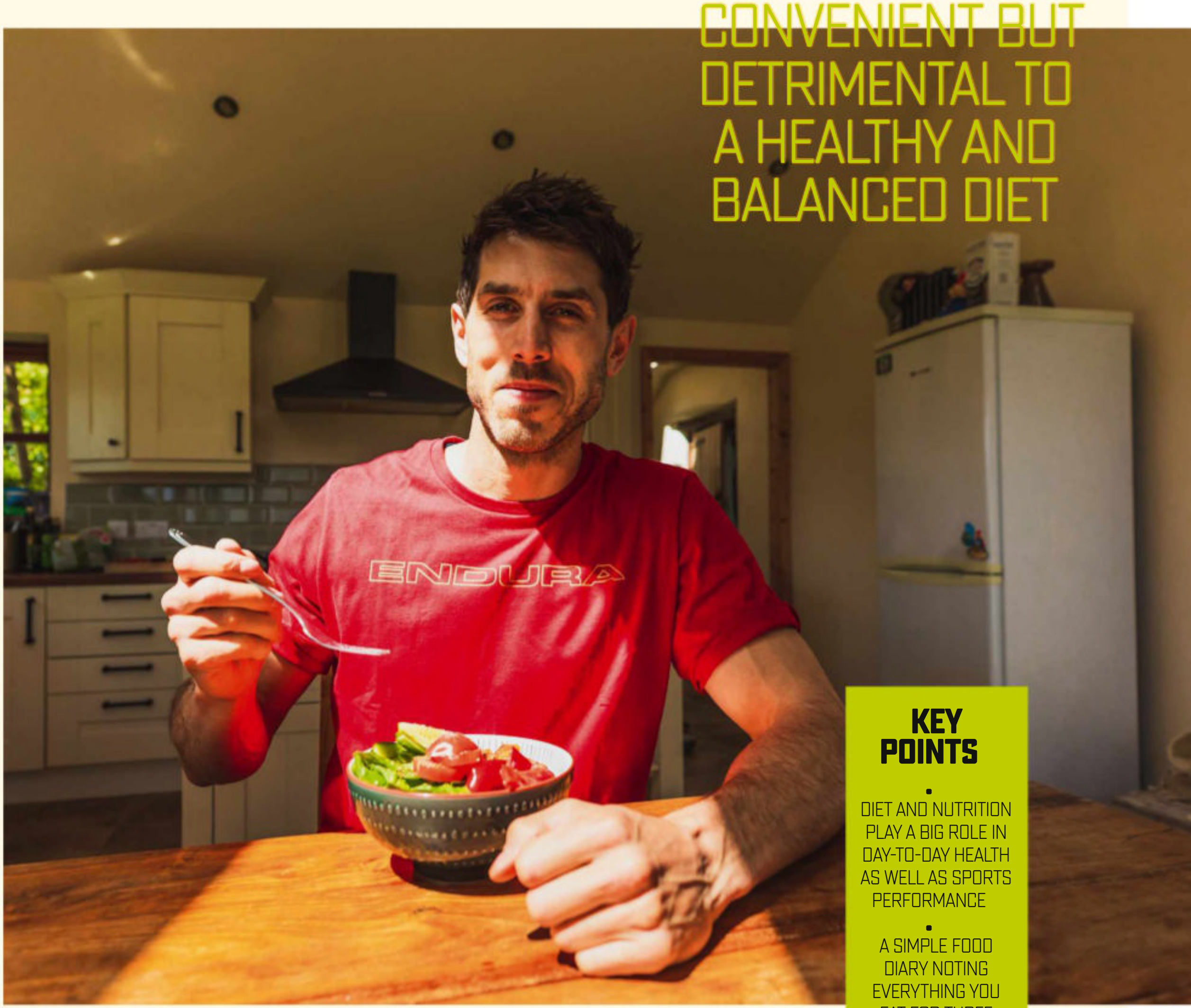
- GOOD SET-UP WILL MAXIMISE YOUR INVESTMENT AND HELP THE BIKE WORK WITH YOU
- CHECK SHOCK AND FORK PRESSURES AND MEASURE SAG - IS IT APPROPRIATE AND BALANCED?
- TRY ADJUSTING SETTINGS, NOTING THEM DOWN AND COMPARING TO OTHER SET-UPS
- REPEATING SECTIONS WITH A DIFFERENT SET-UP, TYRE PRESSURES OR SHOCK SETTINGS WILL HELP YOU UNDERSTAND YOUR BIKE AND OFTEN MAKE YOU MORE COMFORTABLE ON IT
- THE STOPWATCH IS A USEFUL TOOL TO GAUGE HOW YOU AND YOUR BIKE ARE ATTACKING A SECTION OR STAGE

A GOOD SET-UP WILL MAXIMISE YOUR INVESTMENT AND HELP THE BIKE WORK WITH YOU





PROCESSED FOODS ARE OFTEN CONVENIENT BUT DETRIMENTAL TO A HEALTHY AND BALANCED DIET



4. NUTRITION

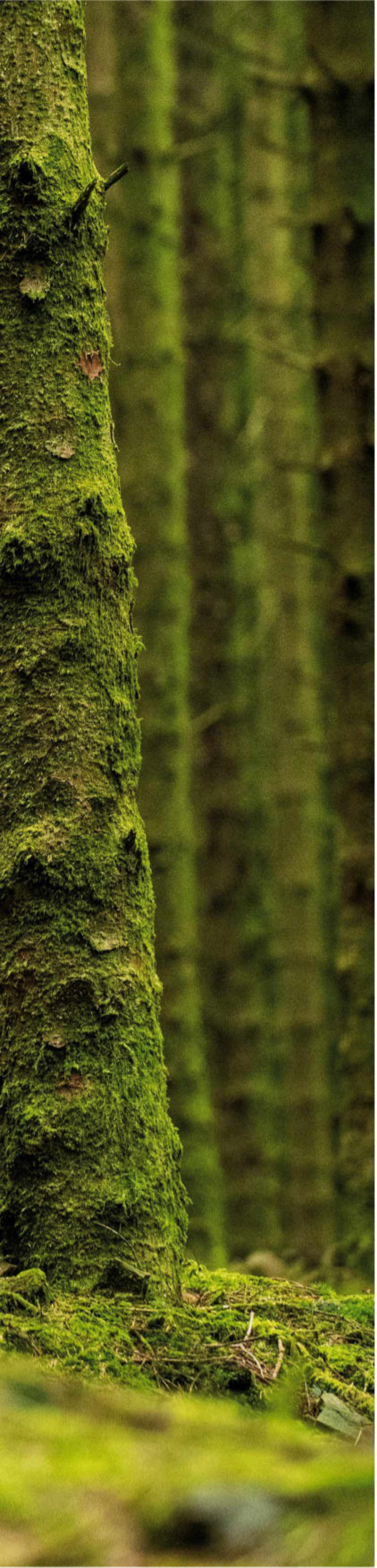
This is an often-overlooked area, but one that can make a huge difference to your performance on the bike. Food is fuel. Too many people don't have a disciplined approach to food intake and will eat the same quantity regardless of whether they're sat down all day at a desk or exercising. Fatty and sugary foods are all too easy to eat, but the downsides are evident, and not just in terms of carrying too much weight. Drinking too much alcohol and snacking on high-calorie foods or drinks after (or during) rides adds more calories than those burned from riding.

THE PRO APPROACH

The rider's power-to-weight ratio is what we're looking to maximise,and lean muscle mass will help this, so building an understanding of what's beneficial, what to avoid and where to find balance is part of my job. Gee and Charlie are very disciplined and have had nutritionist input. They manage their diets well, cutting out processed, sugary products and other food sources that are detrimental to their performance. We monitor body weight and power-to-weight and ensure we understand a healthy range, as weight loss often isn't the goal, but rather maximising body composition and fuelling many hours of high-intensity exercise.

KEY POINTS

- DIET AND NUTRITION PLAY A BIG ROLE IN DAY-TO-DAY HEALTH AS WELL AS SPORTS PERFORMANCE
- A SIMPLE FOOD DIARY NOTING EVERYTHING YOU EAT FOR THREE DAYS WILL GIVE YOU A GOOD INSIGHT INTO YOUR DIET, AND OFTEN BE EYE-OPENING!
- PROCESSED FOODS ARE OFTEN CONVENIENT BUT DETRIMENTAL TO A HEALTHY AND BALANCED DIET
- FUEL FOR THE DAY AHEAD – BUSY DAYS OF EXERCISE WILL REQUIRE MORE CALORIES THAN A DAY DRIVING OR SAT AT A DESK. A GOOD DIET REQUIRES DISCIPLINE



GET FIT FAST

Up your fitness by 10% in just eight weeks, on the trail and at home

The main reason we ride is for fun, and if you're fitter you can ride harder and further, and have even more fun! This eight-week training programme for trail/enduro riders will improve your fitness by 10 per cent. It's based on three rides per week plus one or two home workout sessions that don't even require any equipment.

The programme's set so that you do the bulk of your training at the weekend, but if you have more time during the week, ride then – just don't do the harder sessions back to back. You can ride for longer if you want, especially on the endurance rides, but don't duplicate your hard sessions, as you'll need sufficient recovery time, and don't worry if you have to miss the odd session.

It's a good idea to record your training so that you can measure your progress – try online tools like Strava or Training Peaks.

TRAINING INTENSITY

Throughout this training programme you'll be working at different intensities, each of which can be measured using your heart rate (HR) or perceived exertion level. Work out your heart-rate zones as a percentage of your maximum heart rate – 220 minus your age gives a rough max HR.

ZONE	PERCEIVED EXERTION ON A 10-POINT SCALE	HEART RATE % OF MAX	FEELING	TYPE
Zone 1	1 Very light 2 Fairly light	55%	Very light, can breathe easily, little muscular exertion	Warm up
Zone 2	3 Moderate 4 Somewhat hard	65%	Noticeable increase in breathing rate but still able to hold a conversation	Recovery
Zone 3	5 Hard 6	75%	Breathing hard, uncomfortable feeling but sentences possible	Aerobic
Zone 4	7 Very hard 8	85%	Deep, forceful breathing and don't want to talk	Anaerobic
Zone 5	9 10 Very, very hard	95-100%	Breathing extremely hard and can't even talk	Maximum

THE BASICS

Before you start, learn how to get the best out of every session

WARM UP

Decrease the risk of injury and maximise your training benefits.

Off-bike warm up

Do each exercise for 30 secs, then repeat the list.

1. Head twists: slowly, from side to side.
2. Arm circles: full circles, forwards and back.
3. Jogging on the spot: keep your knees up.
4. Squats: wide stance, go down until your thighs are parallel to the floor.
5. Lunges: big step forward, go down keeping your chest up and return.

On-bike warm-up

1. Ride for 5mins at a low intensity.
2. Over 20secs, build pace from 50% to 80%. Repeat three times with 20secs of recovery.
3. Over 20secs, build pace from 60% to 90%. Repeat 3 times, hitting 100% on last rep. Have 20secs of recovery.
4. Ride until you feel ready to do your session.

COOL DOWN

At least 5mins of low-intensity exercise, either on the bike or jogging.

RECOVERY

If you're training hard, quality rest is just as important as training.

Hydrate. You'll be losing fluids while exercising, so replace the loss during and after.

Eat well within one hour of exercising – good-quality wholefoods, rather than fatty, high-sugar, processed fare.

Stretch after cooling down, to maintain flexibility. Hold your stretches for 20-30secs.

As well as rest, low-intensity activities such as walking are also good for effective recovery.

YOUR SESSIONS

01 Endurance ride

What?
A long ride at low intensity to improve your aerobic capacity, recovery and ability to burn fat.

How?
Keep your cranks spinning at around 90 revolutions per minute. Try not to stop and keep a consistent pace and level of effort.

Sample session
- Ride in Zone 2 for 1hr 30mins.

02 Aerobic intervals

What?
Periods of effort and recovery that up the intensity of your training.

How?
Keep your heart rate up during the intervals. Make sure the terrain you choose enables you to do this – create a mini lap that includes some technical skills.

Sample session
- On-bike warm-up
- 3 x 5min intervals in Zone 3 with 5mins in Zone 2 recovery between each interval
- Rest of ride in Zone 2
- Cool down

03 High-intensity interval training

What?
Shorter periods of effort and recovery at a higher intensity that require your maximum level of physical and mental effort.

How?
You'll be working at maximum effort for very short periods. Therefore, you should ride non-technical terrain so that you can concentrate on effort.

Sample session
- On-bike warm-up
- 4mins of 10secs hard (Zone 5)/ 50secs easy
- 4mins of 20secs hard/40secs easy
- 4mins of 30secs hard/30secs easy
- Rest of ride in Zone 2
- Cool down

04 Hill repetitions

What?
To improve your on-bike strength and muscular endurance.

How?
Like normal intervals, with effort on the way up and recovery on the way down. Do every hill climb seated at 60 revs per min.

Estimate 30secs on the hill and mark it point-to-point so you ride the same distance for every repetition.

Sample session
- On-bike warm-up
- 6 x 30secs hill climbs at Zone 4 with ride down
- 20secs of recovery
- Rest of ride in Zone 2
- Cool down

05 Condition sessions

What?
Short, intense and fast

THE EXERCISES

UPPER BODY

Press-ups

Start with chest on floor, feet together and hands just outside shoulder width. Extend arms until straight, keeping your body in a straight line. Lower yourself until your upper arms are parallel to the floor, then extend back up. If you struggle, pivot from your knees instead of toes.

Tricep dips

Put your hands on the edge of a bench with fingers facing forwards and legs extended in front. Bend elbows and lower bum towards the floor with a straight back. Extend your arms to complete one rep.

Walk-out press-ups

Stand with arms by your side. Crouch down and put your hands on the floor in front of your toes. Walk out to a press-up position, keeping your feet in the same position. Do a press-up and walk back in, then stand up.

Close-hand press-ups

Start with your chest on floor, feet together and hands together under your chest. Extend your arms until straight, keeping your body in a line. Lower yourself until your upper arms are parallel to the floor, then extend back up.

CORE

Sit-ups

Lie on your back with feet on floor, knees at 90 degrees and fingers to temples. Curl up using your abs until your elbows meet your knees. Lower yourself down until your upper back touches the floor.

Twist-sits

Lie on your back with feet on floor, knees at 90 degrees and fingers to temples. Curl your torso up and twist so opposite elbow touches your knee. Repeat on other side.

Dorsal raises

Lie face down, fingers on temples. Slowly lift your chest, keeping your feet on the floor, then lower yourself down slowly.

Planks

Lie face down, resting on forearms and toes to hold your body off the floor, keeping it in a straight line. If you're struggling, do the same but from your knees.

Hip raises

Lie on your back with knees at 90 degrees and feet flat on floor. With arms by your side, raise hips until your body is in a straight line with your thighs. Hold for 1sec, then lower back slowly.

LEGS

Bunnyhops

Stand side-on to a 30cm-high obstacle. With feet close together, squat down, jump over it and straighten up again.

Lunges

Take a big step forward and sink down, with chest upright, until rear knee is 6cm off the floor. Then stand up, pushing off with front foot and keeping rear one stationary. Change legs.

bodyweight sessions to up your muscular endurance and ability to ride hard. See *The Exercises* below.

How?
Ensure you understand the format of each session and record your time for every one. If you're tiring, regress the exercise rather than stop – for example, just do half press-ups.

Sample session

- Off-bike warm-up
- 15 reps each exercise with as little rest as possible – repeat 6 times
- Cool down and stretch
- 1 x press-ups, 2 x squats, 3 x lunges, 4 x tricep dips and 5 x sit-ups

06 Test sessions

What?
To monitor your progress and give you a goal – eg press-ups measure your muscular endurance, while time trials assess improvement on the bike.

How? Repeat any of the sessions and compare your recorded times.

Lunge jumps
Start in the lunge position with your chest upright. Jump up and land in the same position but with your legs the opposite way around.

Squats
Stand with feet over shoulder width apart, fingers on temples and elbows out. Bend knees and push hips back, keeping back straight and chest facing forwards. Lower yourself until your thighs are parallel to the floor, then return to the standing position.

Squat jumps
As squats, but jump as high as you can from the thighs-parallel position.

WEEK 1 - INTRO

DAY	DAILY PLAN	SESSION PLAN
MON	**REST**	
TUE	**CONDITION SESSION 1 & TEST SESSION** **ACTIVITY** Conditioning Test **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** Also do as many press-ups as you can in 1min and record your score. **SESSION** Complete 15 reps of each with as little rest as possible. Do list x 6 and record your time. 1. Press-ups 2. Squats 3. Sit-ups 4. Lunges **COOL DOWN**
WED	**HIGH-INTENSITY INTERVAL TRAINING 1** **ACTIVITY** Cycling **DURATION** 30mins **ZONES** Minimum 2, average 3, maximum 5	**ON-BIKE WARM UP** **SESSION** 4mins of 10secs hard/50secs easy 4mins of 20secs hard/40secs easy 4mins of 30secs hard/30secs easy Complete the rest of the ride in Zone 2. **COOL DOWN**
THU	**REST**	
FRI	**REST**	
SAT	**AEROBIC INTERVALS 1 & TIME TRIAL 1** **ACTIVITY** Cycling **DURATION** 1hr **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM UP** **SESSION** Measure 2 miles point-to-point, slightly uphill or on a drag. Ride for 10mins then complete 2 x 5min Aerobic Intervals in Zone 3 with 5min Zone 2 recovery periods between each. Complete the rest of the ride in Zone 2. Make sure to record your results. **COOL DOWN**
SUN	**ENDURANCE RIDE 1** **ACTIVITY** Cycling **DURATION** 1hr 30mins **ZONES** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. **COOL DOWN**

WEEK 2 - MEDIUM

DAY	DAILY PLAN	SESSION PLAN
MON	**REST**	
TUE	**CONDITION SESSION 2** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Do 10 reps of each exercise, immediately followed by 9 of each, then 8, 7, 6, 5, 4, 3, 2, 1. When you hit 1, work your way back up to 10. Do it as fast as you can, resting as much as you need to. 1. Press-ups 2. Sit-ups 3. Squats **COOL DOWN**
WED	**HILL REPETITIONS 1** **ACTIVITY** Cycling **DURATION** 30mins **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM-UP** **SESSION** Do 6 x 30sec hill climbs at Z4 intensity with a ride down + 20sec recovery. Do all hill climbs seated, aiming for 60 revolutions per minute. Do the rest of the ride in Zone 2. **COOL DOWN**
THU	**CONDITION SESSION 3** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Do 20secs of exercise 1 then have 40secs recovery. Then do the same for each. Repeat list x 2. 1. Press-ups 2. Lunges 3. Sit-ups 4. Squats 5. Planks **COOL DOWN**
FRI	**REST**	
SAT	**AEROBIC INTERVALS 2** **ACTIVITY** Cycling **DURATION** 1hr **ZONES** Min 2, av 3, max 3	**ON-BIKE WARM-UP** **SESSION** Do 3 x 6min intervals at Zone 3, with 4mins of Zone 2 recovery between. Do the rest of the ride in Zone 2. **COOL DOWN**
SUN	**ENDURANCE RIDE 2** **ACTIVITY** Cycling **DURATION** 2hrs **ZONES** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. **COOL DOWN**

WEEK 3 - HARD

DAY	DAILY PLAN	SESSION PLAN
MON	REST	
TUE	**CONDITION SESSION 4** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Complete the list as many times as you can in 8mins. 1. Press-ups x 10 2. Twist-sits x 10 3. Squats x 10 4. Lunges x 10 5. Sit-ups x 10 After, do 3 x 30secs of Planks with 30secs' rest after each. **COOL DOWN**
WED	**HIGH-INTENSITY INTERVAL TRAINING 2** **ACTIVITY** Cycling **DURATION** 40mins **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM-UP** **SESSION** Work down and then back up the list. 10secs hard/50 recovery; 20secs hard /40 rec; 30secs hard/30 rec; 40secs hard/20 rec; 50secs hard/10 rec; 60secs hard/60 rec. Complete the rest of the ride in Zone 2. **COOL DOWN**
THU	**CONDITION SESSION 5** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Do 20secs of 1 with 40secs' recovery, then go down the list. Repeat list x 3. 1. Press-ups 2. Lunges 3. Sit-ups 4. Squats 5. Planks **COOL DOWN**
FRI	REST	
SAT	**AEROBIC INTERVALS 3** **SPORT** Cycling **DURATION** 1hr 30mins **ZONES** Min 2, av 3, max 4	**ON-BIKE WARM-UP** **SESSION** Do 3 x 6min at Zone 3 for 3mins, then Zone 4 for 3mins, with 4mins of Zone 2 recovery between each. Do the rest of the ride in Zone 2. **COOL DOWN**
SUN	**ENDURANCE RIDE 3** **ACTIVITY** Cycling **DURATION** 2hrs 30mins **ZONES:** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. **COOL DOWN**

WEEK 4 - EASY

DAY	DAILY PLAN	SESSION PLAN
MON	REST	
TUE	**CONDITION SESSION 6 & TEST SESSION** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Do as many press-ups as you can in 1min and record your score. Then do 15 reps of each exercise with as little rest as possible. Do the list x 6 and note your time. 1. Press-ups 2. Squats 3. Sit-ups 4. Lunges **COOL DOWN**
WED	**HILL REPETITIONS 2** **ACTIVITY** Cycling **DURATION** 40mins **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM-UP** **SESSION** Do 6 x 40sec hill climbs at Z4 intensity with a ride down + 20sec recovery. Do the last 2 at max pace. Alternate between standing and seated, aiming for 60 revs per min. Do the rest of the ride in Zone 2. **COOL DOWN**
THU	REST	
FRI	REST	
SAT	**AEROBIC INTERVALS 4 & TIME TRIAL 2** **ACTIVITY** Cycling **DURATION** 1hr **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM-UP** **SESSION** Do the same time trial as in Week 1. Ride for 10mins then complete 2 x 7min intervals at Zone 3, with 3min Zone 2 recovery between each interval. Complete the rest of the ride in Zone 2. Make sure to record your results. **COOL DOWN**
SUN	**ENDURANCE RIDE 4** **SPORT** Cycling **DURATION** 1hr 30mins **ZONES** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. Make sure to record your results. **COOL DOWN**

WEEK 5 - MEDIUM

DAY	DAILY PLAN	SESSION PLAN
MON	REST	
TUE	**CONDITION SESSION 7** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Do 10 reps of each exercise, immediately followed by 9 of each, then 8, 7, 6, 5, 4, 3, 2, 1. When you hit 1, work your way back up to 10. Do it as fast as you can, resting as much as you need to. Record your time and compare to session in Week 1. 1. Press-ups 2. Sit-ups 3. Squats **COOL DOWN**
WED	**HIGH-INTENSITY INTERVAL TRAINING 3** **ACTIVITY** Cycling **DURATION** 45mins **ZONES** Min 2, av 4, max 5	**ON-BIKE WARM-UP** **SESSION** Do this list 2 times: 15secs hard/15secs easy; 30secs hard/ 30secs easy; 45secs hard/45secs easy; 1min hard/ 1min easy. Complete the rest of the ride in Zone 2. **COOL DOWN**
THU	**CONDITION SESSION 8** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** Do 30secs of 1 with 30secs' recovery, then go down the list. Repeat list x 3. 1. Press-ups 2. Lunges 3. Sit-ups 4. Squats 5. Planks **COOL DOWN**
FRI	REST	
SAT	**AEROBIC INTERVALS 5** **SPORT** Cycling **DURATION** 1hr **ZONES** Min 2, av 3, max 4	**ON-BIKE WARM-UP** **SESSION** Do 3 x 6mins at Zone 4, with 4mins of Zone 2 recovery between each. Do the rest of the ride in Zone 2. **COOL DOWN**
SUN	**ENDURANCE RIDE 5** **SPORT** Cycling **DURATION** 2hrs **ZONES** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. **COOL DOWN**

WEEK 6 - HARD

DAY	DAILY PLAN	SESSION PLAN
MON	REST	
TUE	**CONDITION SESSION 9** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Complete the list as many times as you can in 8mins. 1. Press-ups x 10 2. Twist-sits x 10 3. Squats x 10 4. Lunges x 10 5. Sit-ups x 10 After, do 3 x 30secs of Planks with 30secs' rest after each. Record your results. **COOL DOWN**
WED	**HILL REPETITIONS 3** **ACTIVITY** Cycling **DURATION** 1hr **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM-UP** **SESSION** Do 6 x 40sec hill climbs at Zone 4 with a ride down + 20sec recovery. Do the last 2 at max pace. Alt between standing and seated, aiming for 60 revs per min. Do the rest of the ride in Zone 2. **COOL DOWN**
THU	**CONDITION SESSION 10** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** Min 2, av 3, max 5	**OFF-BIKE WARM-UP** **SESSION** Do 30secs of 1 with 30secs' recovery, then go down the list. Repeat list x 3. 1. Press-ups 2. Lunges 3. Sit-ups 4. Squats 5. Planks **COOL DOWN**
FRI	REST	
SAT	**AEROBIC INTERVALS 6** **ACTIVITY** Cycling **DURATION** 1hr 30mins **ZONES** Min 2, av 3, max 4	**ON-BIKE WARM-UP** **SESSION** Do 5 x 6mins at Zone 4, with 4mins of Zone 2 recovery between each. Do the rest of the ride in Zone 2. **COOL DOWN**
SUN	**ENDURANCE RIDE 6** **ACTIVITY** Cycling **DURATION** 2hrs 30mins **ZONES** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. Record the distance you've covered. **COOL DOWN**

WEEK 7 - V. HARD

DAY	DAILY PLAN	SESSION PLAN
MON	REST	
TUE	**CONDITION SESSION 11** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Perform 30secs of 1, then have 30secs' recovery. Do this for 2 more sets on each exercise so you're doing 3 sets before moving on to the next one. Repeat list x 3. 1. Hip raises 2. Lunges 3. Twist-sits 4. Squat jumps 5. Planks **COOL DOWN**
WED	**HIGH-INTENSITY INTERVAL TRAINING 4** **ACTIVITY** Cycling **DURATION** 45mins **ZONES** Min 2, av 4, max 5	**ON-BIKE WARM-UP** **SESSION** Do this list 2 times: 5mins of 10secs hard/20secs easy; 5mins Zone 2; 5mins of 30secs hard/ 30secs easy. Do the rest of the ride in Zone 2. **COOL DOWN**
THU	**CONDITION SESSION 12** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Do 30secs of 1 with 20secs' recovery, then go down the list. Repeat list x 3. 1. Press-ups 2. Lunges 3. Sit-ups 4. Squats 5. Planks **COOL DOWN**
FRI	REST	
SAT	**AEROBIC INTERVALS 7** **ACTIVITY** Cycling **DURATION** 1hr 30mins **ZONES** Min 2, av 3, max 4	**ON-BIKE WARM-UP** **SESSION** Do 5 x 6mins at Zone 3, with 4mins of Zone 2 recovery between each. Do the rest of the ride in Zone 2. **COOL DOWN**
SUN	**ENDURANCE RIDE 7** **SPORT** Cycling **DURATION** 3hrs **ZONES** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. Record the distance you've covered. **COOL DOWN**

WEEK 8 - EASY

DAY	DAILY PLAN	SESSION PLAN
MON	REST	
TUE	**CONDITION SESSION 13 & TEST SESSION** **ACTIVITY** Conditioning **DURATION** 30mins **ZONES** N/A	**OFF-BIKE WARM-UP** **SESSION** Do as many press-ups as you can in 1min and record your score. Then do 15 reps of each exercise with as little rest as possible. Do the list x 6 and note your time. Afterwards, compare to your Week 1 score 1. Press-ups 2. Squats 3. Sit-ups 4. Lunges **COOL DOWN**
WED	**HILL REPETITIONS 4** **ACTIVITY** Cycling **DURATION** 45mins **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM UP** **SESSION** Do 3 x 30sec hill climbs at Zone 4 with a ride down + 20sec recovery. Do the last 2 at max pace. Alt between standing and seated, aiming for 60 revs per min. Then repeat as 4 x 1min hill climbs. Do the rest of the ride in Zone 2. **COOL DOWN**
THU	REST	
FRI	REST	
SAT	**AEROBIC INTERVALS 8 & TIME TRIAL 3** **ACTIVITY** Cycling **DURATION** 1hr **ZONES** Min 2, av 3, max 5	**ON-BIKE WARM-UP** **SESSION** Do the same time trial course as in Weeks 1 & 4. Ride for 10mins then complete 2 x 7min intervals at Zone 4, with 3min Zone 2 recovery between each interval. Complete the rest of the ride in Zone 2. **COOL DOWN**
SUN	**ENDURANCE RIDE 8** **ACTIVITY** Cycling **DURATION** 1hr 30mins **ZONES** Min 2, av 2, max 3	**ON-BIKE WARM-UP** **SESSION** Ride for the allocated time with an average intensity of Zone 2. Record the distance you've covered. **COOL DOWN**

UPGRADES & TECH

GET YOUR BIKE SORTED

Give your steed some TLC with these 10 easy but important home workshop checks

COTIC
AIR
COTIC
HUNT

1 CREAKY BACKSIDE

A dirty, poorly maintained seatpost can cause irritating creaking when you're putting down the power seated. Carefully remove the post from the frame and give it a clean (take care with internally-routed droppers – be sure to release the cable from the remote if you don't have enough slack to remove the post). Check for signs of damage then apply a thin layer of grease before sliding the post back into the frame and torqueing it up to the manufacturer's specified setting. Next, loosen off the seat clamp and remove the saddle. Give the clamp a thorough clean and examine it for signs of damage. Check the saddle rails too. Once clean, replace the saddle, tightening the clamp bolts to the specified torque setting.

10 HAPPY HOOPS

Carefully and slowly rotate your wheels to inspect the condition of the tyres. You're looking for cracks or splits in the sidewalls, holes in the carcass and worn or ripped treads. Don't forget to check both the front and rear tyres. If they're looking rather tired out (sorry), it's time to buy yourself some fresh rubber.

9 CHAIN GANG

It may be a boring job, but degreasing your drivetrain is hugely beneficial, both on the trail and on your wallet, because it'll last longer if it isn't covered in grit. It's best to remove the chain and cassette, and give them a proper soaking in degreaser to get them sparkling. Give the rear mech a good clean too. Check for chain wear – chain-wear tools don't cost a fortune and will give you an indication of how stretched your chain is and whether it needs replacing. Leave it too long and you'll need to buy a new cassette too. Finally, lubricate your chain, dripping the lube onto the inside of the links, where they make contact with the cassette and chainring teeth. Wipe the excess off gently.

8 GREASE MONKEY

Whip out your wheels, pull your headset apart and remove your bottom bracket. Check the hub bearings, headset bearings and BB for signs of wear or damage. Before putting them back together, give everything a thorough clean and apply some fresh grease where necessary (if you're not sure, grease wherever the manufacturer specifies). Once you've reassembled the hubs and headset, and replaced the BB, tighten them to the brands' specified torque settings.

2 CHECK ONE, TWO

Months of winter riding can work bolts loose. So, arming yourself with a torque wrench and all the relevant torque settings, work methodically from the front to the back of your bike, checking all the bolts. It's worth double-checking stem, rotor and calliper hardware, and wheel axles, because if these loosen off while riding, the consequences could be horrific.

3 STOPPING POWER

Ensuring your brakes work properly is critical. Even if they don't need bleeding, you still need to check pad and rotor wear. Remove the pads from the callipers and check they're not close to worn-out or worn unevenly. If there's enough pad left, give them a quick buff-up with some sandpaper. Check the rotors for wear – are they worn-thin or grooved? – and spin the wheels to see if the discs are as close to true as possible. If not, carefully tweak them back straight (Park Tool have a great tool for this).

4 SEALED WITH A...

Pull the tyres off the rims and check to see how much sealant is left in there (providing you run a tubeless set-up, of course!) and whether it's coagulated and thus essentially useless. If there isn't a lot left in there, be sure to clean out any lumps before topping the tyre up with fresh sealant – we recommend 100-150ml per tyre. It's also worth removing the valves from the rims because they can gunge up with sealant. Remove the valve cores and check for any blockages, clean them thoroughly and then replace them before you lose them.

5 FEELING TENSE

To check for even spoke tension, work methodically around the wheel (starting and finishing at the valve), pinching together pairs of spokes that are parallel with each other. If you find the odd loose spoke, carefully tighten it at the nipple, a quarter of a turn at a time, until the tension feels the same as that of the other spokes. Be careful not to overtighten it. It's also worth giving your wheels a spin and viewing them from above to check how true they are. A little bit of deviation isn't the end of the world but a big buckle needs addressing (a job for your local bike shop).

6 SMOOTH OPERATOR

Using a clean, dry cloth, give the fork stanchions, shock shaft and the dropper section of your seatpost a good clean, making sure to remove any built-up grime/mud/dust from the wiper seals. Once clean, use a suspension-specific spray lube (being careful not to get it on the brake pads or rotors) and give the seals a blast. Cycle the fork/shock/seatpost up and down a few times, then use another clean cloth to wipe off any grime and residue from the seals. Apply another light coating of lube.

7 REFRESHING REVOLUTIONS

Your pedals are subject to a severe pounding, so use this opportunity to breathe new life into them. Following the manufacturer's guidelines, strip the pedals down and carefully clean and inspect each component for damage. If all that's needed is some fresh grease, then great. If the innards are looking a little worn, now could be the time to invest in a pedal-refresh kit (assuming the brand you have can supply one) to fully overhaul their internals. Once rebuilt, smear some grease on the axle threads before tightening them back into the cranks, turning them towards the front of the bike on both sides.

TYRE CARCASSES

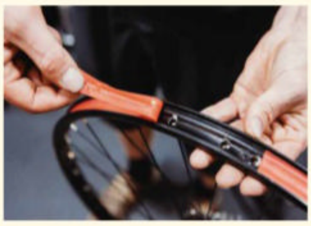
Protection
Enduro and downhill tyres often have multiple layers of puncture protection, including nylon and/or butyl sidewall reinforcement to help them resist tears and pinch flats. These measures add weight and make the tyre less flexible, which increases rolling resistance.

Damping
Damping is the ability of the tyre to dissipate energy when it's compressed and rebounds. Increased damping makes for a less bouncy, more planted ride over rough terrain, but adds rolling resistance. Thicker tyre casings and softer, less elastic rubber compounds increase damping.

Bead
This is the strip along the bottom of each sidewall, which 'locks' into the rim bead when the tyre is inflated. A snug fit makes it easier to get tubeless tyres to seal, without air and sealant leaking everywhere. Cheaper tyres use wire beads, while pricier ones use lighter Kevlar beads.

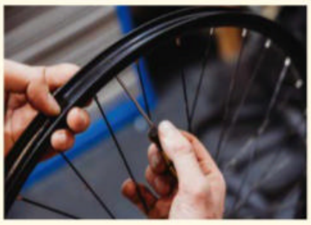
Thread count
The tyre casing is composed of a weave of nylon threads, which stop it stretching like a balloon when inflated. Tyres with a higher number of threads per inch (TPI) are generally more expensive but lighter and more flexible (and so roll faster) because they use finer threads.

QUICK FIX TIPS Set up your wheels tubeless (taping rims and fitting valves)

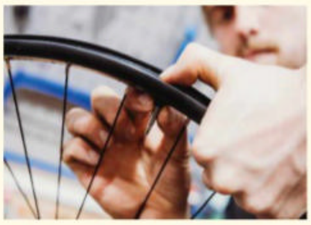


1 Remove the tyre and inner tube from the wheel (if applicable). If no tubeless-ready rim tape is fitted or the tape has started leaking, remove the old rim tape. It's a good idea to clean the rim with hot, soapy water and rags, then let it dry.

2 Take some new tubeless tape (or Gorilla tape) that's just narrower than the rim bed. Starting opposite the valve hole, carefully apply the tape to the rim bed, making sure to keep it taut as you rotate the wheel. Stop when the tape overlaps itself by at least 150mm.



3 Push a pick through the valve hole from the inside of the rim, using just enough force to mark the position of the hole onto the tape. Then push the pick through the tape from the outside of the rim, to create a pilot hole for the valve.



4 Remove the valve cap and threaded collar from the tubeless valve, then push it through the hole in the rim tape from the outside. While pushing the valve firmly against the rim bed with your thumb, thread the collar onto the valve.

TUBELESS SEALANT

Muc-Off
NO PUNCTURE HASSLE
TUBELESS SEALANT
DOC BLUE
ECO SEALANT
JOE'S

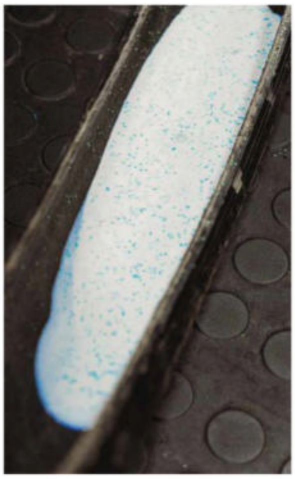
What is tubeless sealant?

Tubeless sealant is a liquid designed to plug small holes in a tyre's casing, thus preventing punctures. It works a bit like blood clotting to prevent bleeding. There are two main types – latex-based and latex-free.

Muc-Off
NO PUNCTURE HASSLE
TUBELESS SEALANT

Latex-based sealant

These use the coagulating properties of synthetic latex to clog punctures. Latex is a dispersion of polymers (long-chain molecules) in water. Inside a hole in the tyre, there's a drop in air pressure and a rush of air. This causes the water to evaporate, leaving the latex molecules to coagulate, plugging the hole.



Sealing particles

Most latex-based sealants also contain small particles, such as glitter. These provide a surface for the latex to coagulate around, helping it to seal holes more quickly and effectively. The downside is that these particles accelerate the rate at which the latex coagulates inside the tyre, reducing the sealant's lifespan.

ECO SEALANT
JOE'S
NO FLATS

Latex-free sealants

These have no latex and no chemical change occurs inside the tyre. Instead, they rely on a thicker liquid containing a wider variety of sealing particles, designed to physically plug punctures, like logs clogging a river. These sealants last far longer but, in our experience, don't plug punctures as well.

FOAM TYRE INSERTS

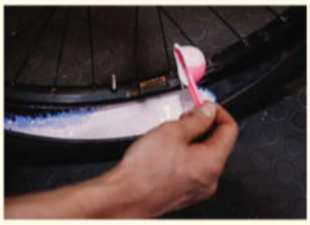
CUSHCORE 27.5"

PROS

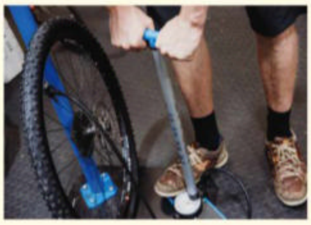
- Tyre inserts are designed to be used in tubeless set-ups, where they act as a cushion between the rim and the tyre, making pinch flats (where the tyre is pinched against the rim, punching a hole in the rubber) less likely.
- Similarly, they can help to spread the load of an impact to protect the rim from denting or cracking.
- Some, such as CushCore, support the tyre's sidewalls, reducing squirm when cornering.
- The above can allow you to run lower tyre pressures, for more grip and traction.
- Some inserts provide additional damping, so the tyre rebounds slower after hitting a bump, improving rough-terrain control.
- Unlike using a thicker tyre to reduce the risk of flats, inserts do not increase rolling resistance.

CONS

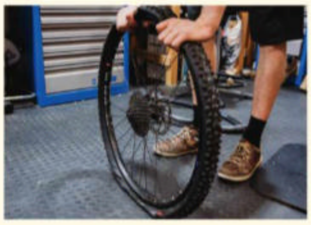
- They add weight to your wheels. The lightest weigh around 80g per end, while some tip the scales at more than 250g.
- Inserts won't stop tears in the tyre, caused by sharp stones or thorns, that are too big for the tubeless sealant to plug. This is where using a tyre with a tougher, heavier casing (instead of adding that weight in the form of an insert) has an advantage.
- None of the systems we've tested has been foolproof – we've punctured tyres and/or dented rims with most of them.
- They can be difficult to install.
- Some inserts suck up sealant, so you'll need to add more, which further increases weight.
- They're expensive.



5 Fit one bead of the tyre onto the rim. Then install three-quarters of the second bead. Measure the recommended volume of sealant (this should be specified on the bottle) into the tyre. Coax the last section of bead into place, using tyre levers if necessary.



6 Make sure the valve sits between the tyre beads. Attach a track pump and pump hard. The tyre should ping onto the rim. Stop when the bead is fully seated, then gradually release air until you reach your desired pressure. Spin the wheel to coat the inside in sealant.



7 If that didn't seat the tyre, roll it along the ground (to massage the bead into the rim) and try again. Still no joy? Remove the valve core to allow quicker inflation (then, once the tyre is seated, reinstall the valve and reinflate the tyre) and/or use a tubeless inflator.

JARGON BUSTER

TUBELESS INFLATOR

A valved canister that's pressurised with air from a track pump. When the valve is opened, air is released rapidly into the tyre, helping to seat it on the rim. Some require a separate pump to pressurise them, while others are incorporated into a track pump.

TWEAK A BIKE TO SUIT A FEMALE RIDER

Small changes can make a big difference to comfort and control

Many so-called 'women's bikes' are just 'unisex' models (which is in itself a bit of a misnomer, because the frames tend to be designed around typical male proportions) with some flowery colours and a wider saddle. They may be available in smaller sizes, but generally have the same geometry (Canyon and Liv are the only brands currently offering female-specific MTB frames). And choice is often distinctly limited, in terms of the different models and specs available. All of this means that buying a unisex bike and fine-tuning it to suit can often be the best route to go down, especially for more serious, aggressive, taller or heavier female riders. Here are some set-up pointers…

01
SADDLE

Saddle soreness may just be the most talked-about topic in women's cycling, so fitting a decent female-specific seat is the first thing you should do if you opt for a unisex bike. There are tons of options out there – our favourites include Specialized's Power models with 'Mimic' technology, fi'zi:k's Luna X5 and Bontrager's Yatra. Don't be fooled into thinking that thicker padding will equal more comfort. Getting a perch that has a cut-out to reduce soft-tissue pressure and is the correct width for your sit bones is much more important. You should be able to get advice and fitting help at your local bike shop.

02
SUSPENSION

If you're a smaller, lighter rider you may struggle to use the full travel of your fork or shock, even with the correct sag for your weight. Try removing one or two volume spacers, to make the spring curve slightly less progressive. You may also find the preset rebound/compression tune too firm, in which case you'll need to ask a suspension specialist to tweak the internals.

05
BRAKES

Many brakes offer lever reach adjustment, via a built-in dial or an Allen/Torx bolt. This allows you to move the lever blade closer to the bar, making the lever easier to reach with smaller hands.

03
HANDLEBAR

Most modern bikes come with wide bars (760mm+), for extra leverage and control. Bar width should increase with shoulder width though, and because women are generally less broad than men, you may need to get the hacksaw out.

06
STEM

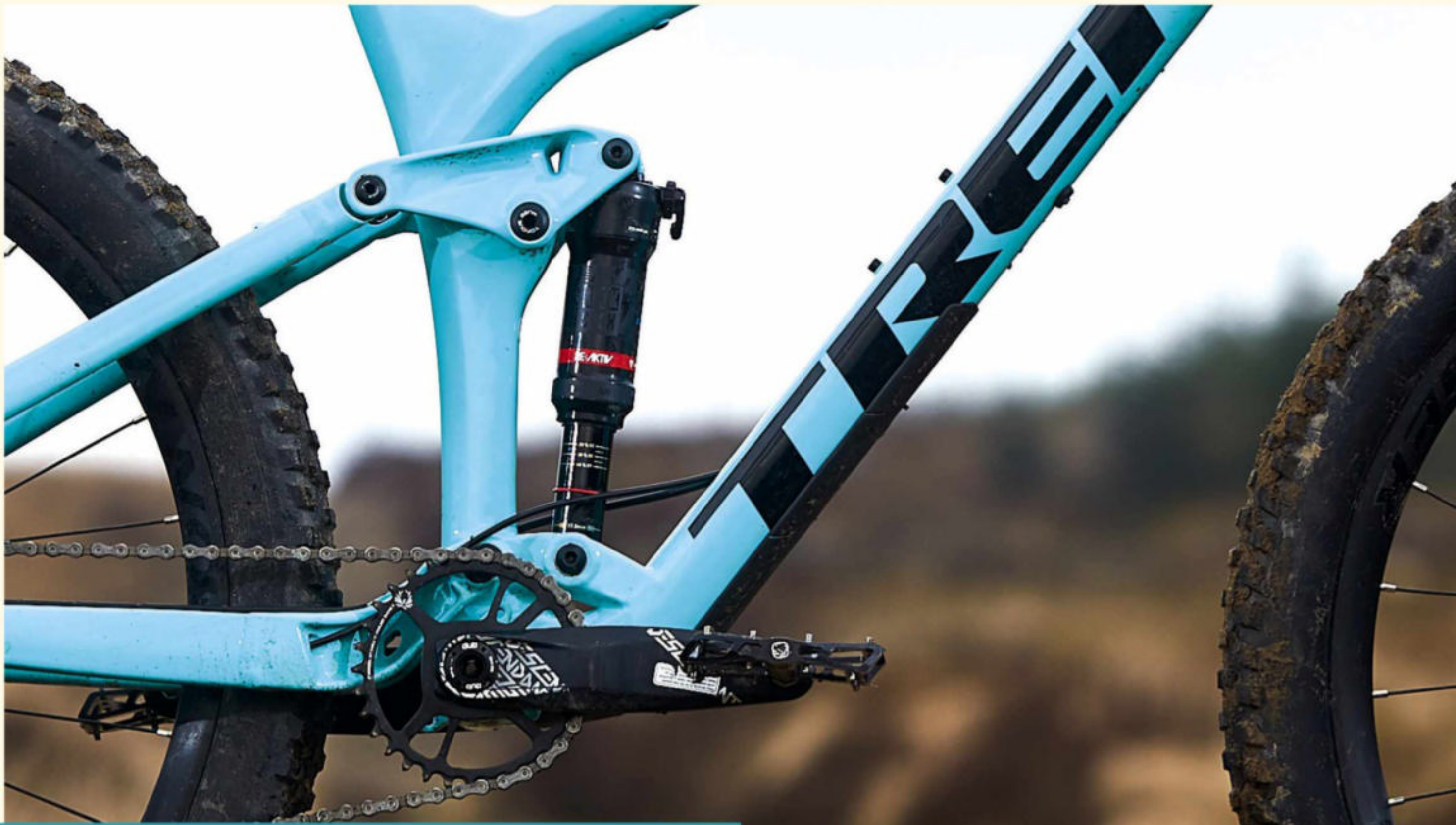
If you fall between frame sizes or have a short torso but long legs (or vice versa), a longer/shorter stem can be used to increase/decrease the length of the cockpit slightly. But it's worth noting that, for aggressive riding, you'll sacrifice control with anything longer than 50mm. Similar results can be achieved by fitting a bar with less or more backsweep.

04
GRIPS

Smaller hands require narrower grips. Trying to hang on to grips that are too big in diameter will tire out your hands and make your forearms pump up. A few women's-specific options are available, but it's generally just a case of picking some grips that suit your hand span.

07
TYRE PRESSURES

Women are generally lighter than men and can get away with running softer tyre pressures for extra grip and (especially on a hardtail) comfort. How low you can go will depend on your weight, riding style, wheel size, tyre width and casing, whether your wheels are set up tubeless or with inner tubes, and the terrain you're riding. As a rough guide, start at around 25psi and adjust downwards until you reach a pressure you're happy with, where your tyres are able to conform around small trail obstacles but don't squirm in corners and you're not getting lots of pinch punctures.



ADJUSTING AIR SPRINGS

When to adjust air pressure

The air pressure dictates the suspension's spring rate. In other words, it determines its 'firmness' throughout its travel. If the suspension is too soft, there's too much sag (the proportion of the bike's travel that's used when sitting still on it) – ie. more than 30 per cent of the available stroke – and the bike sits too low in its travel, add more air pressure. Reduce air pressure if the sag is too low – typically less than 25 per cent. This will cause the bike to sit too high in its travel, so it'll lack traction and feel skittish in the rough or unstable on steep descents. You may also struggle to use full travel.

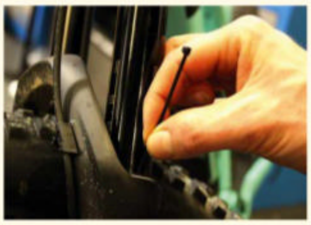
When to add/remove volume spacers

For a given air pressure, adding volume spacers makes the suspension firmer as it gets closer to the end of its travel. Usually, they only significantly affect the final third of the stroke and their effect is greatest at the very end. If your sag is correct and the bike isn't sitting too low during normal riding but you're bottoming out easily, add spacers. If your suspension is lacking in support or sitting too low and you still aren't using all your travel, remove spacers. This will allow access to the final third of the travel, to better absorb bumps, while allowing you to use more air pressure to keep the bike higher during normal riding.

QUICK FIX TIPS Basic suspension fork maintenance (cleaning and lubing wiper seals, etc)

1 After each ride, it's a good idea to clean the wiper seals. Use a rag for this, then wrap it around the back of the stanchions (upper legs) to get the dirt out from behind the fork arch. Shock and dropper post seals will appreciate the same treatment.

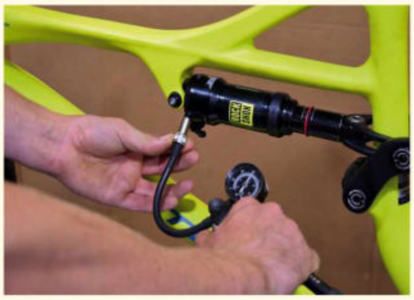
2 A fork spray can be used to increase the slipperiness of the stanchions and wiper seals slightly. Spray the lubricant onto a clean rag and liberally coat the stanchions and seals. Push the fork into its travel a few times before wiping off the excess.



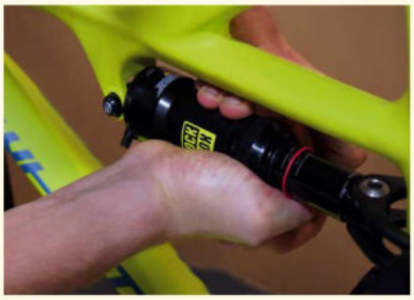
3 Over time, air can get trapped inside the fork lowers, reducing its sensitivity to bumps. Every few rides, coat a small ziptie in chain lube, then slip the thin end about two centimetres under the fork wiper seals to release any air.

4 Make sure the axle is installed properly. The quick-release lever should take some pressure to close, but shouldn't be too hard. It should close without fouling on the fork, ideally parallel to the fork leg. To adjust the lever, consult the manufacturer's instructions.

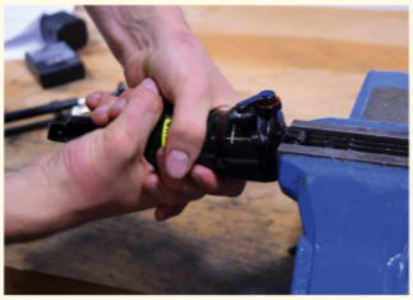
QUICK FIX TIPS Add/remove volume spacers in a RockShox Deluxe or Super Deluxe air shock



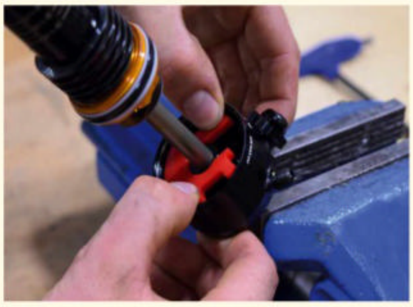
1 Take a note of the pressure in the shock by first removing the air cap and then installing a shock pump onto the valve. Remove the shock pump and deflate the shock by gently pressing an Allen key into the Schrader valve until all the air escapes.



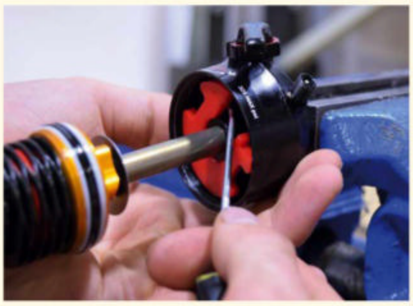
2 On bikes where the shock is easily accessible, it's possible to do this job without removing the shock from the bike. Unscrew the air can anticlockwise by hand. If it's tightly screwed on, you may need a dry cloth or even a strap wrench to get enough grip.



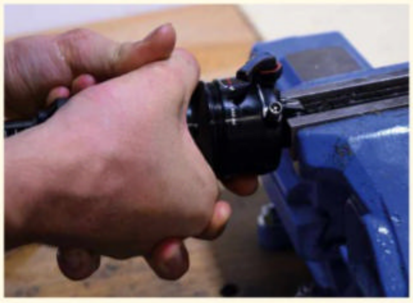
3 If the shock's hard to reach, remove it from the frame by following the manufacturer's instructions. Clamp the shock hardware closest to the rebound adjuster in a vice and remove the hardware from the other end. Unscrew the air can and slide it off.



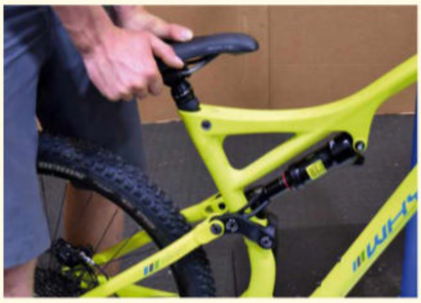
4 To add volume spacers, first pull the rubber O-ring and metal plate near the head of the shock down the grey shaft. Push the volume spacer(s) onto the black shaft at the head of the shock. Slide the metal plate and O-ring back to the top of the shaft.



5 To remove volume spacers, pull down the rubber O-ring and metal plate, then use a pick to lever the volume spacer loose and carefully pull it out, without scratching the shock. Store it somewhere safe, in case you want to reinstall it at a later date.

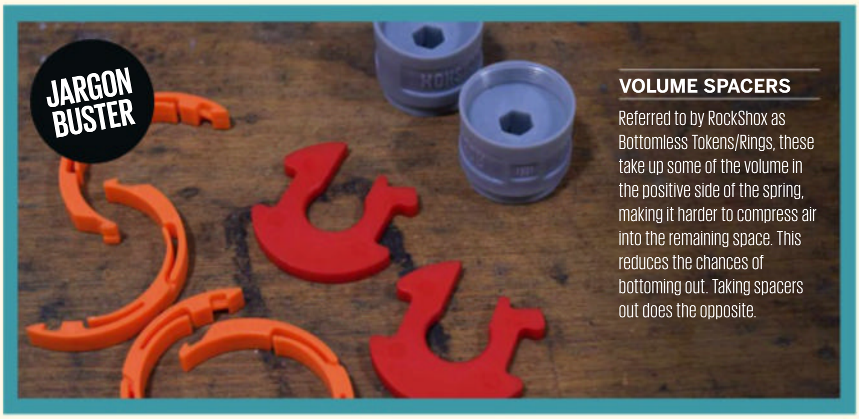


6 Push the air can towards the head of the shock. There'll be resistance until the can nearly engages the threads, when the air should escape, making it much easier. While applying pressure on the can towards the head of the shock, turn it clockwise until it's firmly hand-tight.



7 If you removed the shock, reinstall it according to the manufacturer's instructions. Inflate it to the desired pressure. Compress it to just under the 20 per cent sag mark, where you should feel the air rushing into the negative spring. Reset the air pressure and fit the valve cap.

JARGON BUSTER



VOLUME SPACERS

Referred to by RockShox as Bottomless Tokens/Rings, these take up some of the volume in the positive side of the spring, making it harder to compress air into the remaining space. This reduces the chances of bottoming out. Taking spacers out does the opposite.

5 If you're not going to be using your bike for a while, it's a good idea to store it upside-down. This allows lubricating oil to drain towards the bushings and wiper seals, rather than pooling in the lowers. This can improve the fork's sensitivity on your next ride.

6 Fitting a mudguard can help to extend the service life of your fork, by preventing water, mud, dust and other crap getting onto the stanchions and seals in the first place. As a bonus, it'll reduce the amount of crud that gets flicked up into your face!

7 The fork will eventually need a proper service, so check its service intervals. As a rough test, push down on the fork and release your weight gradually – if it re-extends in jumps, rather than a smooth, continuous movement, it's probably due a service.

JARGON BUSTER

FORK SERVICE

Most brands recommend a lower leg service after a prescribed period of time, or annually. This involves taking the fork apart, cleaning it and replacing the oil and seals. We showed you how to do this for Fox forks in *MBUK* 362. A full service involves taking the internals apart.

JULIANA
MAXXIS
FOX

SUSPENSION TROUBLESHOOTING

10 common fork- and shock- related issues and how to fix them

PROBLEM	PROBABLE CAUSE	SOLUTION
Not getting all of the available travel from your fork or rear shock	Sag could be set incorrectly or there may be too many volume spacers in the positive chamber of the air spring	Check the sag – fork sag can be anywhere from 10 to 15 per cent and generally comes down to personal preference; a good starting point for most shocks will be around the 30 per cent mark. If the sag is correct, check for volume spacers, and remove one if possible. Reset the sag and try again. Repeat if necessary.
Constantly bottoming-out your fork or shock (using all available travel), even on small-to-medium-sized bumps	Incorrect air-spring pressure	Start by resetting the sag (see above). You can then fine-tune how much the fork or shock ramps up towards the end of its travel by adding volume spacers to the positive chamber of the air spring, to help it resist bottoming-out.
Fork feels harsh over small bumps and it's hard to find front-wheel traction	Too much low-speed compression damping	Make a note of the number of clicks of low-speed compression damping available (counting from fully closed, indicated by a locked padlock symbol, '+' or 'firm'). From fully closed, gradually back off (reduce) the amount of damping until things feel more comfortable.
Shock bobs a lot when pedalling and wallows in berms	Not enough low-speed compression damping	Make a note of the number of clicks of low-speed compression damping available, as above. From fully open (open padlock, '-' or 'soft'), gradually increase the amount of damping until the pedal bob is calmed.
Back end of the bike feels really harsh when tackling rough, rocky trails	Too much high-speed compression damping	Work out how much high-speed compression damping is currently applied, by counting the clicks as you turn the adjuster to the fully closed position (locked padlock, '+' or 'firm'). Return to your start point and back off the damping by two clicks (turning the adjuster towards the open padlock, '-' or 'soft'). Repeat as necessary.
Bike uses up its available travel too quickly on rough, rocky trails	Not enough high-speed compression damping	Work out how much high-speed compression damping is currently applied, as above. Return to your start point and add two more clicks of damping (towards the closed padlock, '+' or 'firm'). See how the bike feels and add more clicks, one at a time, if needed.
Fork gets overwhelmed when tackling successive quick hits	Too much rebound damping, causing the fork to 'pack down' and leaving it unable to recover between bumps	Work out how much rebound damping is currently applied, by counting the clicks as you turn the adjuster to the fully closed position ('+' or tortoise symbol). Return to your start point and back off the damping by two clicks (towards the '-' or hare). Ride the same piece of trail over and over, reducing the damping until the fork moves fast enough to recover and absorb bumps.
Back end of the bike feels too springy and out of control over rough terrain	Too little rebound damping	Work out how much rebound damping is currently applied, as above. Return to your start point and add two more clicks of damping (turning towards the '+' or tortoise symbol). Keep going until the back end of the bike returns in a controlled way, but doesn't feel out-of-control fast or too sluggish.
Fork feels strange under braking, as if the bike has a loose headset	Worn bushings, allowing the lower legs to wobble on the upper tubes	Book your fork in for a suspension service and get those bushings replaced.
Oil and gunk around the fork wiper seals	Worn-out seals and/or old lubricating oil	Try a lower leg service, replacing the wiper seals and foam rings, and adding new lubricating oil. Or, send it to a service centre and get the experts to take a look.

SUSPENSION INTERVENTION!

Do you struggle to tell your VPP from your VPL? Does the term anti-squat mean diddly-squat? Never fear, we're here to cut through the marketing waffle and explain how your bike's suspension really works.

Words Seb Stott

SINGLE PIVOT

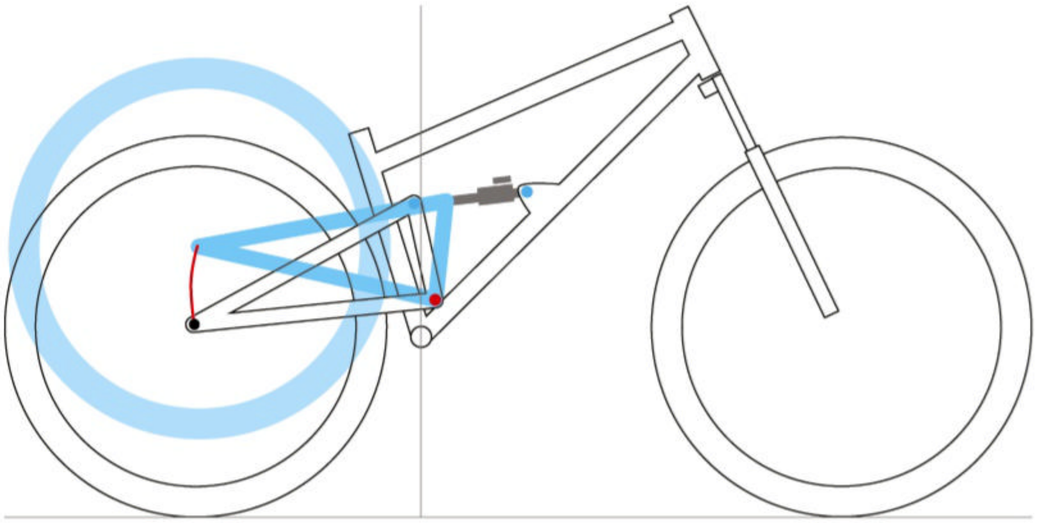
This is the simplest suspension design. A swingarm connects the rear wheel axle directly to a pivot point on the mainframe, and drives the shock directly too. Because there's just a single pivot, the axle moves in a constant arc centred on it. The simplicity of this design makes for easier maintenance (there's just one pair of pivot bearings), but offers designers less control over parameters such as **anti-rise**. More importantly, single-pivot bikes lack **progressivity** and may bottom out (use up all their travel) too readily, although this can be mitigated by fitting a progressive air shock. In the early days of mountain bike suspension, single-pivot bikes were common. Now, they've largely been superceded by linkage designs, although **Orange** continue to stick with this tried-and-tested set-up and it remains popular with smaller UK steel frame builders, such as **Curtis**, **Starling** and **Swarf**.

KEY

🔴 PIVOTS

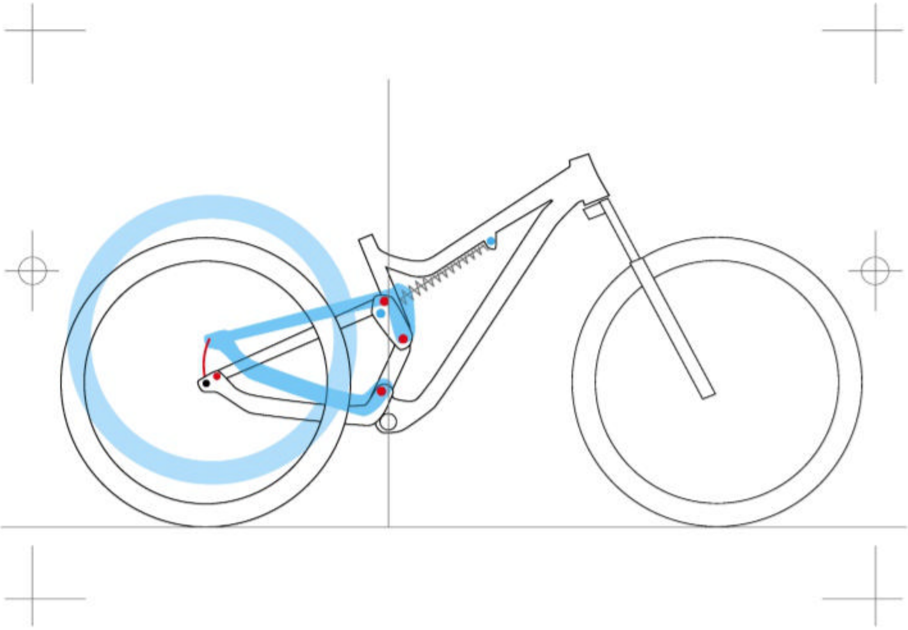
🔵 SHOCK MOUNTS

— WHEEL PATH



LINKAGE-DRIVEN SINGLE PIVOT

This is essentially a single-pivot design, in that a swingarm connects the rear axle directly to a pivot on the mainframe, but with a linkage (system of links) to drive the shock. That gives designers more control over how the leverage ratio (see below) changes throughout the travel. This can be used to build **progressivity** into the frame, helping to prevent bottom-out without relying on a progressive shock. On **Evil's** 'DELTA System' bikes, a one-piece swingarm drives a two-stage linkage connected to the shock. **Cannondale** (though not on the new Habit), **Commencal**, **Kona** and others use a visually different but functionally similar design – pictured below – where a pivot just above the rear axle makes the seatstays part of the linkage, in combination with a rocker link connected to the shock. This looks similar to a four-bar **Horst link** set-up (see overleaf), so is sometimes referred to as a "faux-bar" system.



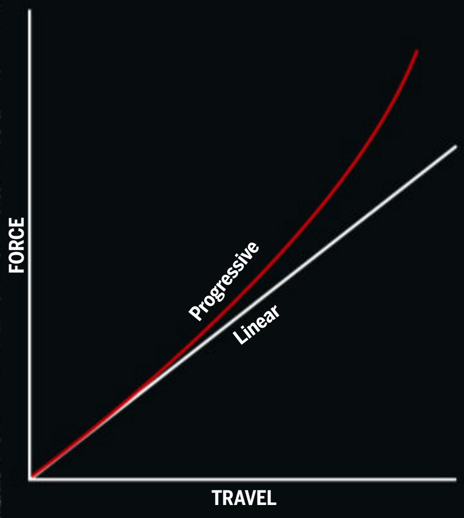
INSTANT EXPERT: ANTI-RISE

What is it?
When you apply the brakes, your weight shifts forwards. This causes the fork to compress and the rear suspension to extend, or 'rise'. Torque from the rear brake, generated by the calliper rotating relative to the rotor when the suspension compresses, counters this to some extent – a phenomenon known as '**anti-rise**'.

What affects it?
How much anti-rise a bike has depends on the position of the **instant centre** (see overleaf). The further forward and lower the IC, the less anti-rise. Twin-link and Horst link designs, particularly those with co-rotating links, tend to have an IC that's further forward than on a single-pivot bike.

What effects does it have?
High levels of anti-rise cause suspension to sit deeper into its travel when braking, which can give **progressive** bikes a firmer feel when you're on the anchors. On the plus side, anti-rise helps prevent brake dive, by stopping the rear suspension from rising as much under braking.

INSTANT EXPERT: PROGRESSIVITY



What is it?
A bike's **leverage ratio** is how far the rear axle moves for every millimetre the shock shaft moves. '**Linear**' suspension set-ups maintain the same leverage ratio throughout their travel, so the effective **spring rate** of the bike (how hard it is to compress the suspension at any point in its stroke) is dictated entirely by the spring rate of the shock. On '**progressive**' frame designs, the leverage ratio decreases as the suspension moves through its travel, making it progressively harder to compress the shock, irrespective of the spring rate of the shock itself. This 'ramping up' towards the end of the stroke is known as 'progressivity'.

What affects it?
Not only do suspension systems have differing amounts of progressivity built in, but rear shocks do too. Coil-sprung shocks are naturally linear, while air springs are naturally progressive and can be made even more so. So, a bike with a linear suspension design, such as a single-pivot, can be made progressive by using an air shock. And bikes designed to be compatible with coil shocks tend to have progressive linkages.

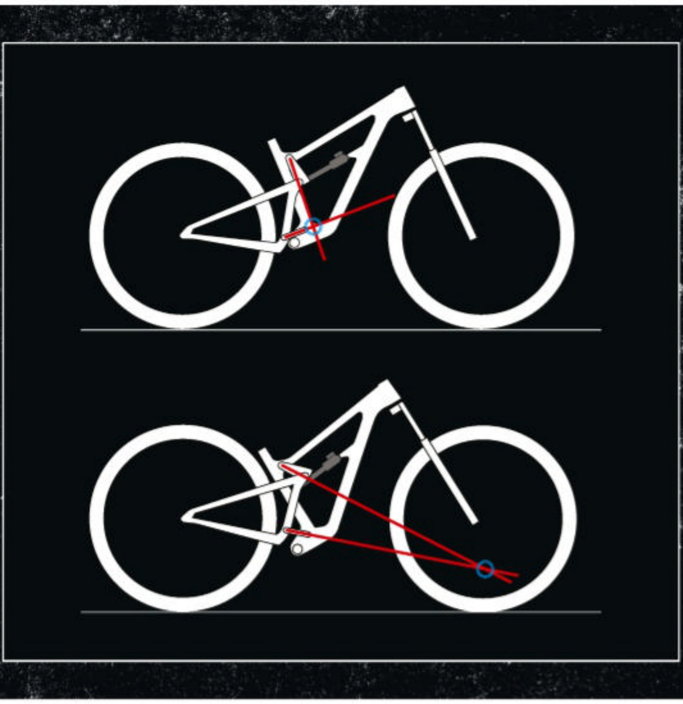
What effects does it have?
On a linear bike, the suspension doesn't ramp up towards the end of its stroke. This can lead to harsh bottom-outs unless you increase the spring rate (by upping the air pressure or fitting a heavier coil), which reduces small-bump sensitivity and grip. On a progressive bike, the firmer end to the stroke means you can maintain the same spring rate without bottoming out – or even reduce the spring rate, for a softer feel earlier in the travel without bottoming out any more than a linear bike.

INSTANT EXPERT: INSTANT CENTRE

What is it?
The **instant centre** (IC) is the point that the rear wheel axle is rotating around at any given point in the travel.

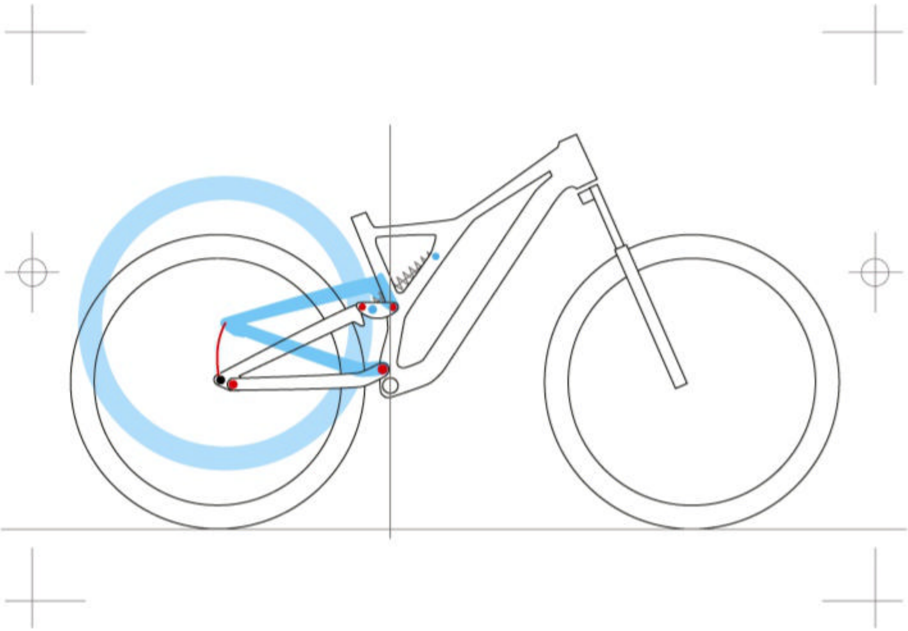
What affects it?
On single-pivot bikes (including linkage-driven varieties), the IC is simply the main pivot point. On **twin-link** (pictured) designs, the IC 'floats' at the intersection of lines drawn through both pivots of each of the two links that connect the rear triangle to the mainframe. The same is true of **Horst link** bikes, but here the second 'link' is the chainstays. In both cases, this means the IC moves as the links rotate.

What effects does it have?
The IC dictates the path of the rear wheel. On single-pivot bikes, the axle moves in a constant arc centred on the main pivot. Some other designs, particularly those with links that counter-rotate, deliver an axle path that moves in a variable arc with no fixed centre. This makes it possible for the **anti-squat** to peak in the 'pedalling zone' of the travel.



HORST LINK

Horst link suspension – named after the man who pioneered it, Horst Leitner – is marked out by a pivot on the chainstays, between the rear axle and mainframe pivot. It's often referred to as a 'four-bar' set-up, because it splits the bike's rear end into four sections, each connected via pivots (chainstay, seatstay, rocker link and seat tube). As on a linkage-driven single-pivot bike, the four-bar linkage allows control of the leverage ratio. But, because the rear axle isn't directly connected to the mainframe, it moves in a path which isn't centred around any one of the pivots. Instead, an **instant centre** defines the direction of the rear wheel at any given point in the travel. Depending on the position of this instant centre, the effect of braking forces on the suspension – known as **anti-rise** – can be reduced relative to any single-pivot design. This may improve the sensitivity of the suspension while braking. **Specialized** patented the design in the mid 1990s and continue to use it on their 'FSR' bikes. This meant other US brands could only use it under licence, so most looked for alternatives. It remained popular with European manufacturers such as **Whyte** and **YT** though, and since the patent expired a couple of years ago, a load more brands have begun using it, including **Nukeproof** and **Transition**.



INSTANT EXPERT: ANTI-SQUAT

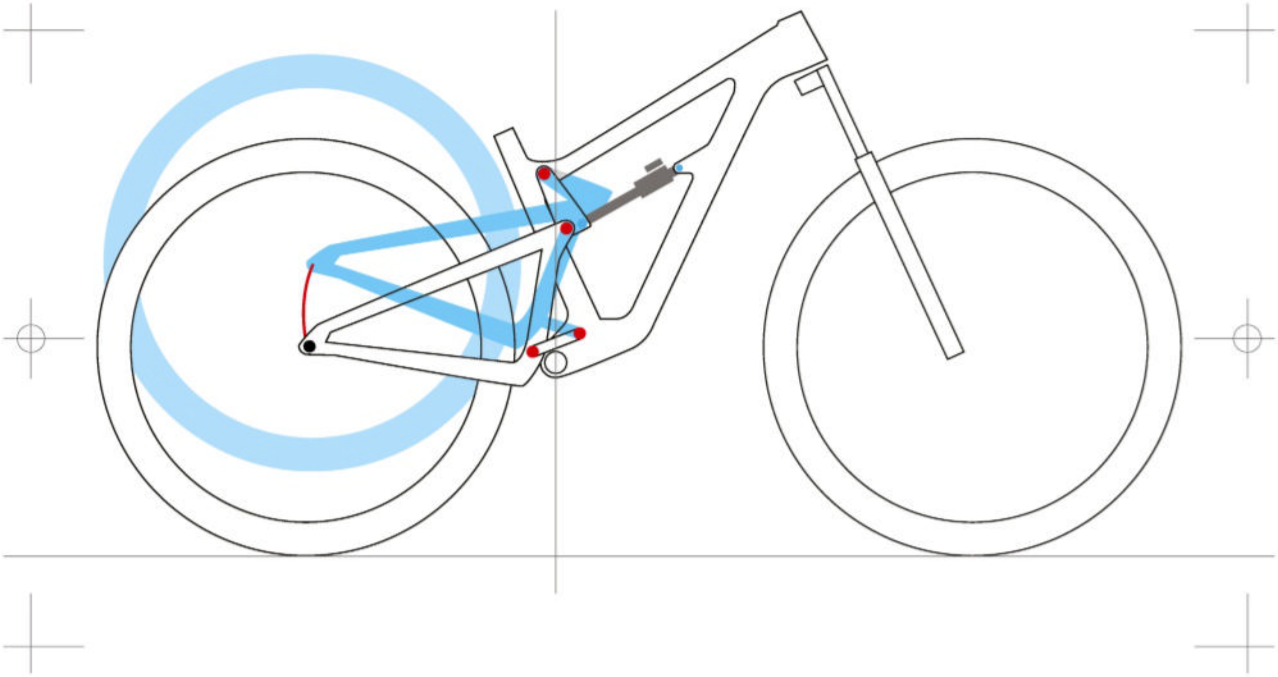
What is it?
Just as braking pushes your weight forwards, acceleration pushes it back. Every pedal stroke causes the suspension to squat into its travel and then re-extend. Known as 'pedal bob', this wastes pedalling energy. Savvy designers can use chain tension to restrict this – a force known as '**anti-squat**'.

What affects it?
On most designs, the main pivot is above the bottom bracket. That means the rear axle moves away from the BB slightly as the suspension compresses. This adds to the tension created in the upper part of the chain as you pedal, countering the suspension's tendency to compress. The more a linkage moves the axle away from the BB, the more effective this is.

What effects does it have?
Anti-squat can be used to reduce pedal bob significantly, but there are drawbacks. Because the axle moves away from the BB when the suspension compresses, the chain can pull on the chainring, causing the cranks to rotate backwards. This is known as 'pedal kickback', which can feel harsh through your front foot. All that tension on the chain can also make the suspension less able to absorb bumps while pedalling.

TWIN LINK

These frames use a rigid rear triangle that's connected to the mainframe by a pair of short links. It's another form of four-bar linkage, but with the chainstay pivot much closer to the main pivot than on a Horst link design. Again, the axle's direction is dictated by a moving **instant centre**. Some twin-link set-ups, such as **Santa Cruz's** 'VPP' (Virtual Pivot Point), **Intense's** 'JS Tuned' and **DMR's** 'Orbit Link' systems, use links that counter-rotate (turn in opposite directions). Others, including **Giant's** Maestro layout, **Mondraker's** 'Zero' system and Dave Weagle-designed 'DW-Link' bikes (**Pivot**, **Ibis**), have links that co-rotate (turn in the same direction). With counter-rotating links, the curvature of the axle path can be made to vary through the travel. This can provide **anti-squat** values that peak in the middle of the stroke, where pedalling efficiency is most important, while minimising pedal kickback elsewhere in the travel range.



LEFTFIELD LAYOUTS

For years, brands battled to develop the best suspension system, coming up with all sorts of outlandish designs. When the dust settled, most ended up using their own take on the linkage-driven single-pivot or twin-link bike. Then the Horst link patent expired, and now we suddenly have a lot of very similar-looking four-bar bikes! That doesn't mean there aren't still some innovators out there though…

A.B.P./SPLIT PIVOT

Trek's 'ABP' (Active Braking Pivot) bikes and Dave Weagle-designed 'Split Pivot' bikes from the likes of **Devinci** and **Salsa** use a rear pivot that's concentric with the wheel axle. They're essentially linkage-driven single-pivots, but because the seatstays 'float' between the rear axle and rocker link, the brake calliper doesn't rotate as far around the rotor when you haul on the anchors, so anti-rise is reduced. This means the suspension stays higher in its travel when braking.

SLIDING SWINGARM

Yeti's proprietary 'Switch Infinity' system uses a main pivot that slides up and down on a pair of shafts, along with an upper link that rotates forward as the suspension compresses. Like on some twin-link designs with counter-rotating links, the anti-squat peaks near the middle of the stroke. **Polygon** and **Marin** (on the Wolf Ridge) use Naild's 'R3ACT' system, which attaches a cylindrical stanchion to the (fixed) main pivot, upon which the swingarm can slide up and down.

HIGH PIVOT

These designs, more common on downhill bikes, such as **Commencal's** Supreme DH and **Norco's** Aurum HSP, place the main pivot far above the chainring. This would result in excessive pedal kickback if it wasn't for the use of an idler pulley, which routes the chain up past the pivot. The high pivot gives a rearward axle path, which may help to absorb large bumps (because the wheel is hitting them with fractionally less speed) and also provides anti-squat.

MOJO RISING

WHEEL SCIENCE

ARE BIG WHEELS ALWAYS FASTER OR CAN A 'BUSINESS AT THE FRONT, PARTY AT THE BACK' SET-UP WITH A SMALLER BACK WHEEL GIVE YOU MORE SPEED?

Words Will Soffe **Pics** Andy Lloyd

Mixing up wheel sizes is nothing new – just look at the penny-farthing! When it comes to mountain bikes, Keith Bontrager created the 69er in 2009 – a Trek hardtail with a 29in front wheel and a 26in rear. Specialized did it too with their Big Hit, which paired a 26in front wheel with a 24in rear. But it wasn't until 650b wheels appeared that brands really started mixing wheel sizes, with specialist companies like Foes, Liteville and GeoMetron building assymetric bikes. This set-up has been dubbed the 'mullet', with a 29in wheel ('business at the front') for rolling speed and a 650b ('party at the back') for sharp handling.

IT'S THE RULES

In the racing world, the UCI (cycling's governing body) had ruled that both wheels must be the same size, in order to prevent designers using the aerodynamic advantages of a smaller front wheel in the velodrome. World Cup downhill teams argued that this rule wasn't relevant to off-road disciplines, and the restriction was lifted in 2019. This led to pre-season questions about how well the mullet bike would work on the race track. It didn't take long for Martin Maes to answer, riding his 'mulletised' GT Force to the top of the podium at the opening round of the Enduro World Series, at Crankworx Rotorua. He was followed by Finn Iles and George Brannigan, who finished the Crankworx downhill in second and third respectively. Then, at the first round of the DH World Cup in Maribor, Slovenia, previously vocal 29er-hater Loïc Bruni took the win and Danny Hart came second, both on mullet bikes. The doubters were silenced and clearly there was some advantage (or at least, no disadvantage) to mixing wheels.

ASYMMETRIC OR SYMMETRIC?

The results speak for themselves – at least when it comes to the sharp end of racing. But we wanted to find out if mullet bikes can give everyday riders an advantage too,

Split-second accuracy ensured a fair test

Mojo Rising's Chris Porter – a man who loves to experiment and isn't afraid of a mullet

with some real-world testing. Before we dive into that, let's explore some of the factors that might make a difference…

GRIP Bigger wheels offer more grip because they have a larger tyre contact patch and the bigger diameter means they roll over bumps and obstacles better than 650b (aka '27.5in') wheels. It's not a straightforward win for 29ers though, because like for like, a wagon wheel is going to be heavier and flexier than its 650b counterpart (although more flex isn't necessarily a bad thing).

DRIFTING The greater grip offered by a 29in front tyre means that if you pair it with a 650b rear the smaller wheel will tend to break traction first, making the bike oversteer, or drift. Oversteer on a bicycle is relatively easily dealt with using counter-steering, and is preferable to understeer, which makes the front lose grip before the back. When this happens it often does so unpredictably and ends up with the rider on the floor. With oversteer, the rider knows where the slide will be coming from and can control it.

BUM CLEARANCE Riders running a 29in rear wheel have about 1.5in less clearance above the back tyre (depending on the exact tyre size). It might not sound like much, but for shorter riders, having that much less space to throw the bike around in can make negotiating steep, tight sections of track that bit trickier.

DEVELOPMENT TIME When mullets started appearing on the race circuit, some internet pundits speculated that teams might only be using them as they didn't have a 29in-specific bike yet. But this argument was undermined by the fact that teammates Finn Iles and Loïc Bruni had a full-29er Specialized Demo downhill bike ready to use at the Fort William World Cup but chose not to ride it, instead turning up on a similar bike built around a smaller rear wheel, with a shorter back end and geometry optimised for a 29in front wheel.

GEOMETRY When the 29er revolution came around, some of the early bikes had poor geometry with high bottom brackets and steep head angles. Fitting offset shock hardware can help to overcome this, by lowering and slackening the geometry, but if this isn't enough, then fitting a 650b rear wheel will drop the BB by roughly 13mm and slacken the head angle by around 1.5 degrees. While this is a great move for the home mechanic on a budget, you can guarantee that top EWS and World Cup DH teams, with access to shortened shocks, angled headsets and custom frames, aren't doing it for this reason. There must be another explanation for why they're using the mullet!

TRAVEL It's hard for downhill bike manufacturers to fit a 29in rear wheel into a frame while providing acceptable geometry and over 200mm of travel. For example, the 650b Commencal Supreme V4.2 has 220mm of travel, whereas the 29er version of the bike with the same suspension design has just 200mm.

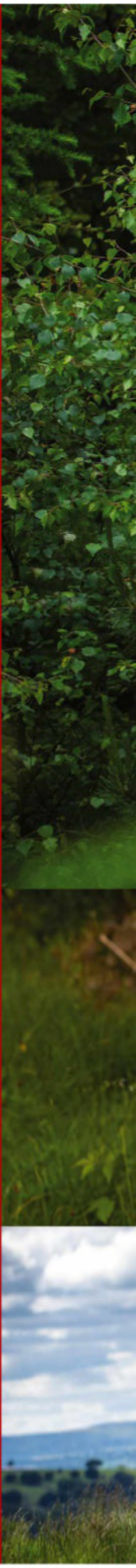
THE NERDY BIT

If you want to delve deeper into the pros and cons of the mullet bike, there are also some geeky physics reasons why its rise might be about more than just fashion. First, let's look at the front axle height in relation to the centre of mass. When the front wheel hits an object that stops the bike, the mass of the bike tries to carry on forward, pivoting around the front axle and flipping the rider over the bars. On a bike with a 29in front wheel, the front axle is roughly 14.5in off the ground (half the wheel diameter, give or take variations in tyre size). If the bike has a 650b rear wheel, the mass of the rear mech, cassette, rear hub and rear brake sits at least 0.75in below the front axle height, at a maximum height of 13.75in (half the diameter of a 650b wheel). In theory, lowering more of the bike's mass below the front axle creates a bike with greater stability, because more weight is driving the rider's feet towards the ground under the front wheel, instead of over the front axle. This effect should also allow the suspension to work more effectively.

For those of you who are full-on nerds, here's a brief insight into why bikes with asymmetric wheels feel unique to ride… The theory suggests that the inertia of the wheels creates a gyroscopic effect, which riders feel when cornering. Having a larger rotating mass that spins more slowly (a 29in wheel goes through fewer revolutions than a 650b wheel over the same distance) on the front of the bike than the rear creates a bike that's eager to turn and wants to keep turning tighter once the turn is initiated. This could be the main reason why riders report that running two different-sized wheels takes some getting used to.

WHO IS WILL SOFFE?

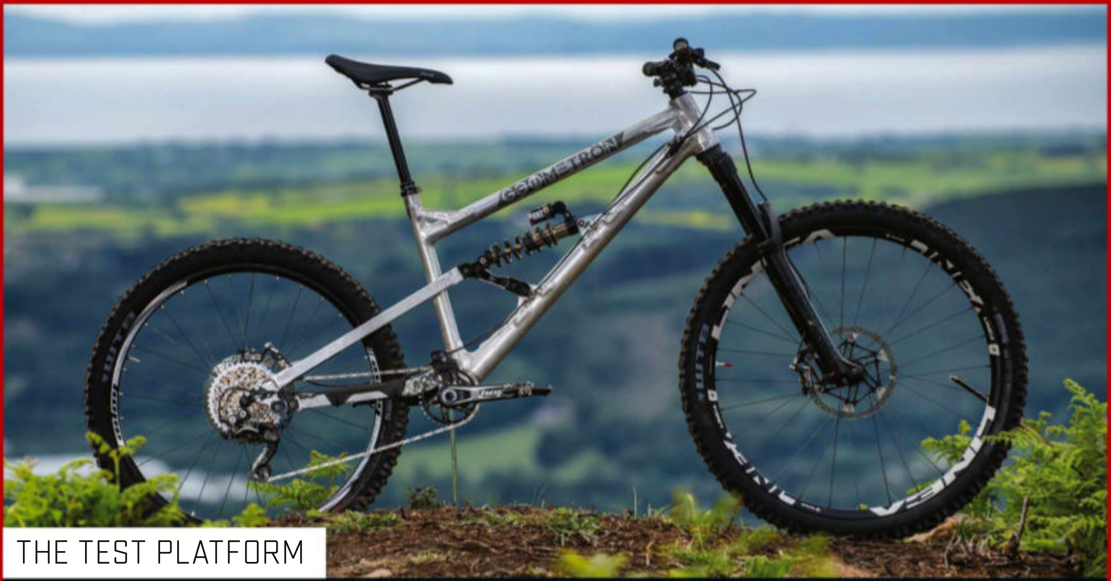
Will has been racing and working on mountain bikes since he was 12 and now competes in the Elite DH category. He's experienced World Cup racing from both sides of the tape, lining up in the gate at Mont-Sainte-Anne in 2014 and then working a full season as a mechanic for Trek Factory Racing. More recently, he's worked at Mojo Suspension, where he first experimented with asymmetric wheels. He's also a coach for British Cycling and runs bike set-up clinics with skills coaching company +3 MTB. And of course, he's a tech geek!



THE FULL 29ER SET-UP WAS SLOWER GETTING UP TO TOP SPEED BUT CARRIED MOMENTUM NOTICEABLY BETTER

STAGE START 1
Please do not touch
Timing system in operation
Many thanks for your cooperation
MOJO RACING

We split the Cwmcarn downhill track into three key sections



THE TEST PLATFORM

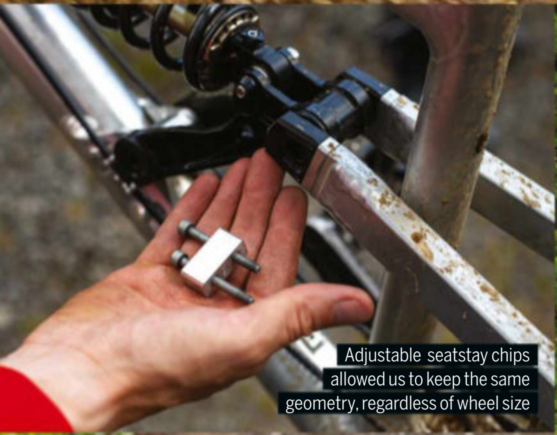
SPEC

Frame: GeoMetron G1, 'longest' size
Shock: EXT Storia V3 Mojo Edition
Fork: RockShox Lyrik 29in, 44mm offset, 170mm travel
Wheels: Formula Linea 2 29in (f&r)/Hope Tech Enduro 650b (r)
Tyres: WTB Vigilante TCS Tough/High Grip 2.5in
Bar: Renthal, 800mm
Stem: Hope, 35mm
Cranks: Hope, 170mm
Drivetrain: Shimano XTR
Pedals: Hope

GEOMETRY

Reach: 515mm
Head angle: 61 degrees
BB height: 445mm
Chainstays: Shortest setting
Travel: 155mm

In corners, the 650b rear wheel made the bike less likely to understeer and encouraged Will to ride closer to the limit



Adjustable seatstay chips allowed us to keep the same geometry, regardless of wheel size

A bar-mounted stopwatch was used for subsequent testing

Will found the mullet-wheeled bike easier to chuck around

TIME FOR TESTING

Many attempts to investigate the benefits of mullet bikes have simply involved taking a stock 29in-wheeled bike and putting a 650b rear wheel on it. While at first this may sound like a fair test, in fact the geometry of the bike has been radically altered (head angle, BB height and more), so the results will not give an accurate comparison. To make our test properly fair we deliberated carefully over bike choice, finally honing in on the GeoMetron G1, designed by Chris Porter of Mojo Rising and made by German manufacturer Nicolai. We chose this bike because it has chips in the seatstays that can be added or removed to change the BB height in precise increments. This allowed us to change the size of the rear wheel but keep the geometry of the bike identical. It also helped that Chris has experimented a lot with mullet bikes – and you won't find a man more eager to test the unconventional anywhere in the bike industry!

We did the majority of our testing on the Y Mynydd downhill track at Cwmcarn in South Wales. That was because we wanted a track that would test all aspects of the bike's handling, and it had to be somewhere we could easily ride back-to-back runs. In the world of UK downhill, Y Mynydd is one of the classics – first raced back in the late '90s as part of the Dragon Downhill series, the track as we now know it was built in 2005 by Rowan Sorrell (the man behind BikePark Wales) and his firm Back on Track, and has terrain that's perfect for bike testing.

We broke the track into three sections: the first is long rocky straights into sharp, low-speed corners; the second is fast, flowing singletrack with tight tree sections and more elevation drop; and the final section is smooth, wide open and very high-speed, with big jumps and tall berms. Using a timing system with race-level accuracy, we did three runs against the clock on each set-up. Then, on a subsequent day, we timed more runs at Clyne Valley Woods in Swansea, to give an indication of performance on flatter, trail-centre-type terrain. The track we chose there is part of the main loop – a smooth blue/red-graded trail with some small jumps and mellow berms. Without a large elevation drop, the bike's ability to carry speed would be highlighted here.

RIDE IMPRESSIONS

The importance of first impressions can be underestimated. As riders, we quickly adapt the way we ride a bike to compensate for any set-up changes. So I spent two weeks riding the G1 before the test, during which I experimented with both rear wheels.

I COULD HUSTLE THE MULLET ALONG WITH PINPOINT ACCURACY

Usually I ride a 650b downhill bike and a 29in trail bike, so don't have a preference, but I found the mullet was more entertaining to ride. When switching wheels it took me a full run to get comfortable on the new set-up. More time dialling in the settings would probably have allowed me to go faster, but rider fatigue was starting to set in after six full-speed runs on the track!

The first thing I noticed with the 650b rear wheel was how eager the bike was to turn in mid-corner. This made it a joy in tight turns, as I could turn the bike in sharply and stand it back up on the exit by counter-steering. I found the 29er pushed on, required more effort and sometimes even a dab of back brake to turn tightly. At the limit of grip on loose gravelly surfaces, the 29er had a tendency to understeer, with the front end threatening to wash out, whereas on the mullet set-up the bike would happily oversteer into a predictable slide. This encouraged me to exploit the available grip and take more risks.

On Cwmcarn's rough, rocky straights, the full 29er set-up was slower getting up to top speed but carried momentum noticeably better, accelerating over bumps rather than getting caught on square edges. In the braking zones, it felt easier to slow the mullet bike down, possibly due to the lighter rear wheel, but maybe because of the increased mass below the front axle height. On the flowing singletrack, the 29er felt more comfortable at speed but sluggish when changing direction, whereas I could hustle the mullet along with pinpoint accuracy. On the big jumps I could throw the mullet around more easily than the 29er, and extra bum clearance meant I could use my body more.

SO WAS IT FASTER?

The times were very tight, so it's hard to draw a clear conclusion from the testing. The 29in bike was faster on the DH track but only by around 0.5 per cent, while the mullet set-up was speedier at the trail centre but only by one per cent. Maybe the advantages of the 29er on rough terrain were more noticeable on the DH track and the mullet's benefits in tighter turns made a difference on the flatter, twisty trail? Taller riders or other riding styles may produce different outcomes, but for me the benefits of the mullet set-up outweighed the ploughing ability of the 29er. At 5ft 10in tall, the extra clearance over the rear tyre was useful when muscling the bike around. Most importantly, it was the confident drifting encouraged by the mullet that's now made it my chosen set-up. We have to conclude by saying that the fastest set-up depends on the track and riding style – just as in the EWS and World Cup DH, where some riders are running 29in wheels and others are bringing back the mullet. ■

SCORES ON THE DOORS

TEST 1

LOCATION: CWMCARN Y MYNYDD
SECTION 1: ROCKY

Run	29in/29in	29in/650b
1	0:58.91	58.32
2	0:58.14	58.77
3	-	59.45 (raining)

TEST 1

LOCATION: CWMCARN Y MYNYDD
SECTION 2: FLOWING SINGLETRACK

Run	29in/29in	29in/650b
1	0:39.99	41.03
2	0:40.08	40.20
3	-	42.48 (raining)

TEST 1

LOCATION: CWMCARN Y MYNYDD
SECTION 3: BIG JUMPS

Run	29in/29in	29in/650b
1	0:44.67	45.60
2	0:44.48	44.78
3	-	46.38 (raining)

TEST 1

LOCATION: CWMCARN Y MYNYDD
FULL RUN

Run	29in/29in	29in/650b
1	2:46.39	2:49.96
2	2:45.90	2:46.80
3	-	2:52.05 (raining)

TEST 2

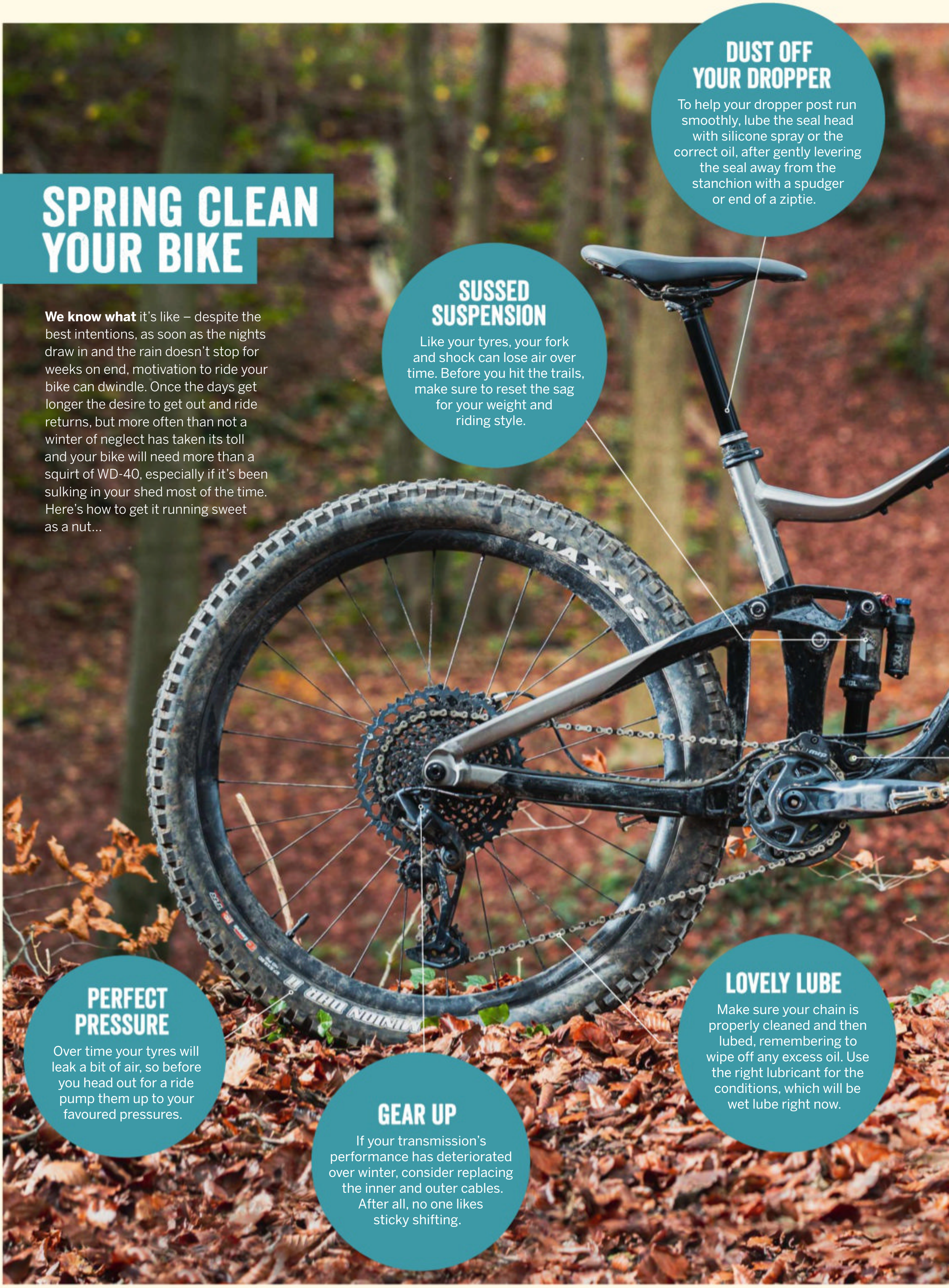
LOCATION: CLYNE VALLEY
SMOOTH, FLOWING SINGLETRACK
TRAIL CENTRE

Run	29in/29in	29in/650b
1	1:21.52	1:20.05
2	1:20.29	1:19.35

Thanks to
Chris Porter and the team at **Mojo Rising** for the loan of the bike, use of their timing system and their technical advice, **WTB** for supplying tyres and Darrell at Cwmdown for putting on uplifts for us.

SPRING CLEAN YOUR BIKE

We know what it's like – despite the best intentions, as soon as the nights draw in and the rain doesn't stop for weeks on end, motivation to ride your bike can dwindle. Once the days get longer the desire to get out and ride returns, but more often than not a winter of neglect has taken its toll and your bike will need more than a squirt of WD-40, especially if it's been sulking in your shed most of the time. Here's how to get it running sweet as a nut...



DUST OFF YOUR DROPPER

To help your dropper post run smoothly, lube the seal head with silicone spray or the correct oil, after gently levering the seal away from the stanchion with a spudger or end of a ziptie.

SUSSED SUSPENSION

Like your tyres, your fork and shock can lose air over time. Before you hit the trails, make sure to reset the sag for your weight and riding style.

PERFECT PRESSURE

Over time your tyres will leak a bit of air, so before you head out for a ride pump them up to your favoured pressures.

GEAR UP

If your transmission's performance has deteriorated over winter, consider replacing the inner and outer cables. After all, no one likes sticky shifting.

LOVELY LUBE

Make sure your chain is properly cleaned and then lubed, remembering to wipe off any excess oil. Use the right lubricant for the conditions, which will be wet lube right now.

STICKY STOPPERS

After long periods of little use, your brakes' pistons can seize up. Remove the wheel and brake pads, and cycle the lever several times to free up the pistons (but not so many times that they pop out). Then use a plastic tyre lever (or similar) to ease them back into their bores.

BOLT IT UP

It's worth checking that your stem bolts are tightened to the correct torque setting. While you're at it, give your chainring and disc rotor bolts the once-over too.

BUTTER UP YOUR FORK

Turn the bike upside-down for 15 minutes so that the fork's lubricating oil reaches the seals. You can also pry the seals open to lube them, in a similar way to your dropper. Your fork will feel ultra-plush!

BEARING BONANZA

If your bike was put away wet or muddy, its bearings could be rusty or seized. You can regrease them yourself if you're handy on the tools. Otherwise it's best to take it to your local bike shop and let them take care of it.

PREPARE YOUR BODY!

Winter will likely have taken a toll on your body too. Here's how to resurrect yourself...

01 Take it easy

If you've not ridden for a while you'll have lost some of your fitness so don't go for a ride expecting to beat all of your PBs. Ease yourself into it and avoid showing up and blowing up on the first turn or climb – you don't want to be *that person* and end up in A&E.

02 Build up your strength and fitness

If mountain biking is a struggle, try cycling to work to improve your fitness and do bodyweight exercises to build up your strength again.

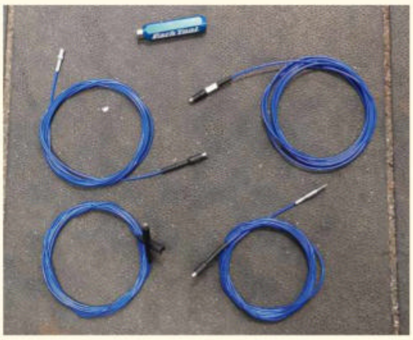
03 Stay in the saddle

Nothing beats time on the bike. The more riding you do, the easier it becomes – your brain will get used to reading and reacting to the terrain, and the movements and techniques you need to ride better, faster and for longer will soon become second nature again.

WORKSHOP TOOLS

YOU DIDN'T KNOW YOU NEEDED!

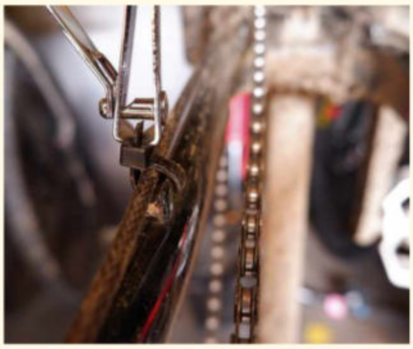
1 **Toe straps (from** the pre-SPD days) or reusable zip-ties are a handy way to hold things in place while you work on your bike. Stop the cranks from spinning, the back end from extending or the bar from twisting, or use them for hanging forks/wheels.



2 **Park Tool's IR-1.2** internal routing tool greatly reduces the faff of routing control lines through your frame. Various cable and hose fittings help you pull old ones through before re-threading a new one, and the strong magnet can guide fresh cables through.

3 **Fed up with** frantic pumping to get tubeless tyres seated? A compressor is definitely a luxury, and they take up lots of space, but you won't be sweating over your tyres any more. An air gun attachment is useful, too, for cleaning and drying components.

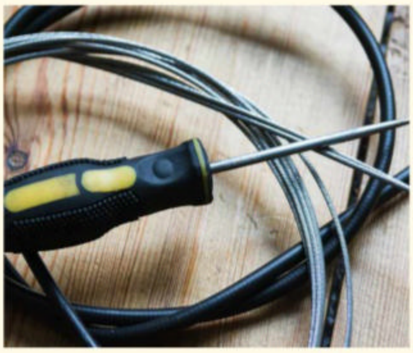
4 **A clean and** tidy hydraulic hose cut makes fitting new olives and barbs for your brake a whole lot easier. Park Tool's HBT-1 hydraulic barb tool gives a clean cut with its replaceable blade, and can effortlessly push a fresh barb in.



5 **Nail clippers aren't** just good for keeping your pinkies trimmed, they're also a great way to neatly snip the end off a ziptie. Leaving a burr can result in a nasty scratch, and it looks much tidier when they're cut flush. Clippers are also good for tidying up hastily-cut hoses.

6 **If you have** more than one bike, with a different set of brakes on each, and perhaps a RockShox Reverb dropper too, a universal bleed kit comes in very handy. These kits – such as the Clarks one pictured – cover most bases, with numerous hose fittings and syringes.

7 **Find yourself regularly** swapping bars or rotors? A small battery-powered drill or screwdriver speeds things up nicely. Just make sure you start threading with your fingers, pick a tool that won't apply much torque and nip the bolts up with a torque wrench afterwards.



8 **Freshly-cut cable** housing can conceal a squashed inner liner or some burrs that could damage your cables. A stitching awl is a cheap pointed tool that can be used to neatly open out the end of a cable outer, avoiding any potential issues down the line.

COCKPIT SET-UP

BAR HEIGHT

Handlebar height has a big influence on handling. A lower bar helps centre your weight between the wheels on climbs and lowers your centre of mass, aiding control, while a higher bar helps prevent that nervous, 'over the front' feeling on steep descents. You can change bar height by moving spacers from above the stem to below it, and vice versa. If you want to go even higher, you'll need to buy a high-rise bar.

BRAKE LEVERS

On steeper descents you may find a more horizontal lever position helps keep your wrists behind the bar, aiding with pushing the bike over obstacles and lowering the risk of your wrists rolling. Use lever-reach and (if present on your brakes) bite-point adjustment to get the pads hitting the rotor at a comfortable point.

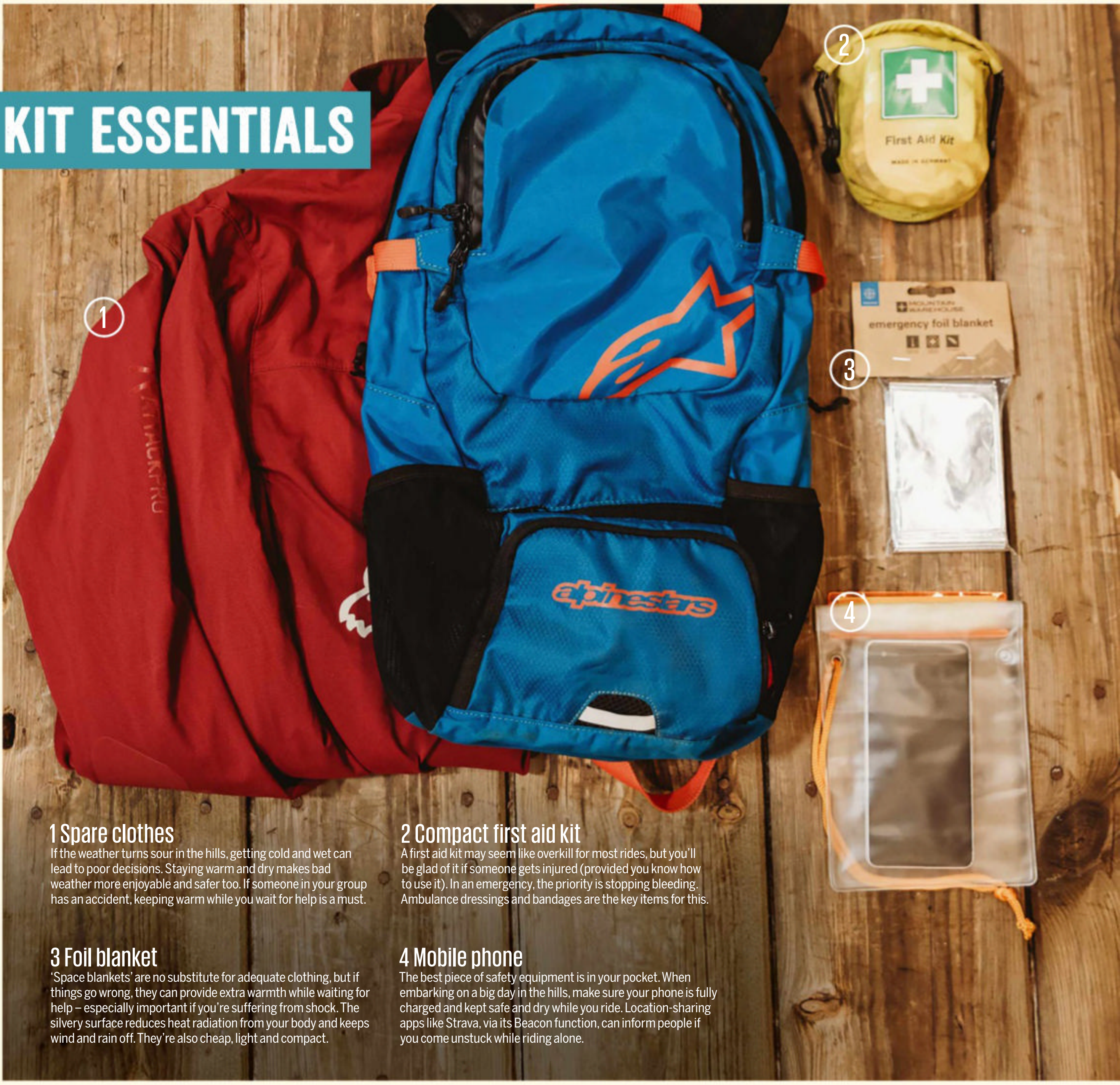
BAR WIDTH

There's no hard and fast formula for bar width – it's a case of trial and error. Buy an 800mm bar, then slide your lock-on grips inboard by 5mm at a time to simulate narrower widths (with end caps fitted!). Ride until you find a width you like, then trim the bar. A narrower bar tends to make it easier to get the front end up in the air, while wider bars suit bigger riders and those who like to plough through terrain.

SHIFTER & DROPPER SEATPOST LEVER

Many brake-lever clamps now double as gear- shifter or dropper-lever mounts, for a tidier cockpit. Get the levers close enough to the bar and grips that you're not straining for them when you're on the limit, but not so close that your knuckles rub on them when gripping hard. Don't roll them too far under the bar, either.

KIT ESSENTIALS



1 Spare clothes

If the weather turns sour in the hills, getting cold and wet can lead to poor decisions. Staying warm and dry makes bad weather more enjoyable and safer too. If someone in your group has an accident, keeping warm while you wait for help is a must.

2 Compact first aid kit

A first aid kit may seem like overkill for most rides, but you'll be glad of it if someone gets injured (provided you know how to use it). In an emergency, the priority is stopping bleeding. Ambulance dressings and bandages are the key items for this.

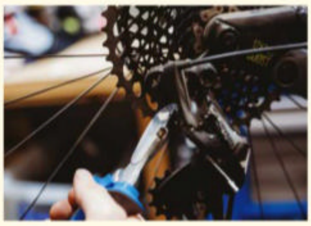
3 Foil blanket

'Space blankets' are no substitute for adequate clothing, but if things go wrong, they can provide extra warmth while waiting for help – especially important if you're suffering from shock. The silvery surface reduces heat radiation from your body and keeps wind and rain off. They're also cheap, light and compact.

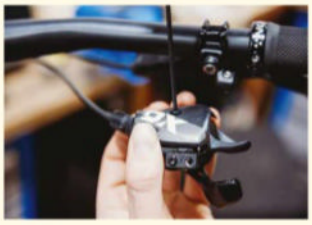
4 Mobile phone

The best piece of safety equipment is in your pocket. When embarking on a big day in the hills, make sure your phone is fully charged and kept safe and dry while you ride. Location-sharing apps like Strava, via its Beacon function, can inform people if you come unstuck while riding alone.

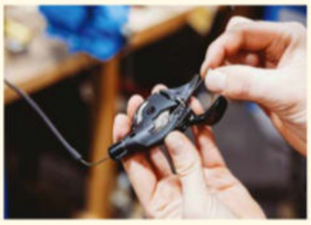
QUICK FIX TIPS Replacing a gear cable



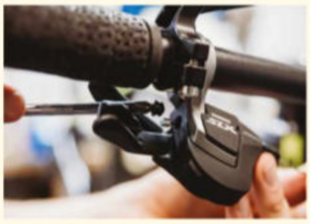
1 Shift into the smallest sprocket. Use cable cutters to snip the old inner cable just ahead of the cable clamp on the rear mech. Unscrew the cable clamp bolt a few turns (usually with a 5mm Allen key or T25 Torx key). Discard the end of the cable.



2 If you have a SRAM shifter (skip to step 4 for Shimano), use a T25 Torx key to unscrew the bolt securing the shifter to the bar clamp. Remove the shifter from the bar. Using a 3mm Allen key, unscrew the bolt on top of the shifter.

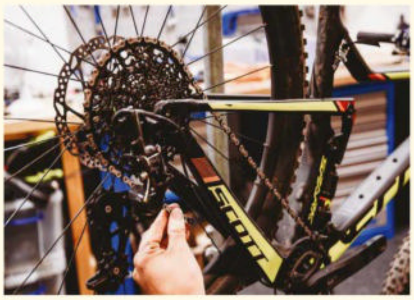


3 Pull the shifter away from the outer cable to expose a few inches of inner cable, then push the inner cable through the shifter. Prise the inner cable out from under the spiral spring, then draw it fully through the shifter and discard it.

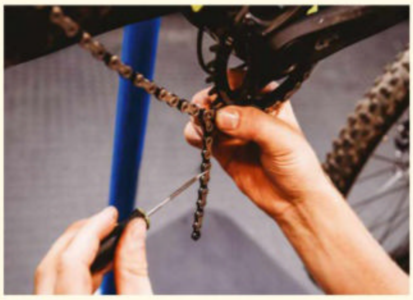


4 If you have a Shimano shifter, use a large cross-head screwdriver to unscrew the plug on the outboard side. Pull the outer cable away from the shifter to expose some inner cable, then push the inner cable all the way through the shifter and discard it.

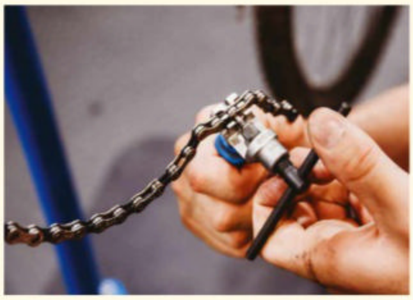
QUICK FIX TIPS Get the right chain length



1 Route the chain round the (largest) chainring and largest sprocket, skipping the rear mech. Attach half a split link to one end. If your bike has rear suspension, compress it fully (note shock pressure, release all air, push swingarm up and strap it to the mainframe).

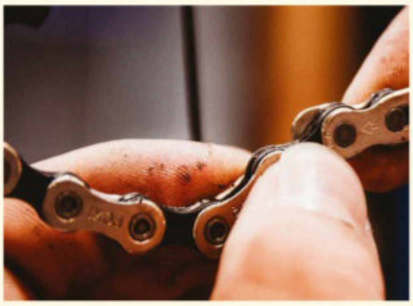


2 Find the pin that will, once replaced with the other half of the split link, keep the chain taut. You'll need to break the chain at the fourth (SRAM 11/12-speed) or second (all other chains) pin along from the one you've identified, on the overlapping section.

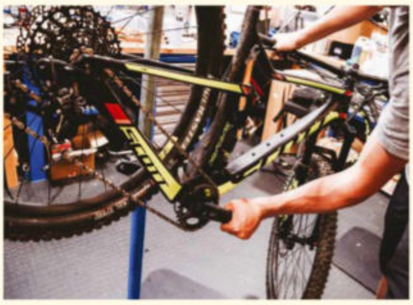


3 Place the links joined by the pin you want to remove on the teeth of a chain tool (the pair of teeth furthest from the handle, if there are two sets). Ensure everything is lined up, then turn the handle clockwise until the pin is pushed out and the surplus links fall away.

4 Unscrew the tool. Shift the mech so it's below the smallest sprocket, then route the chain over the sprocket and through the mech. The chain will be easier to join if not under tension. Activate the 'Cage Lock' (some SRAM mechs) or use a chain hook.



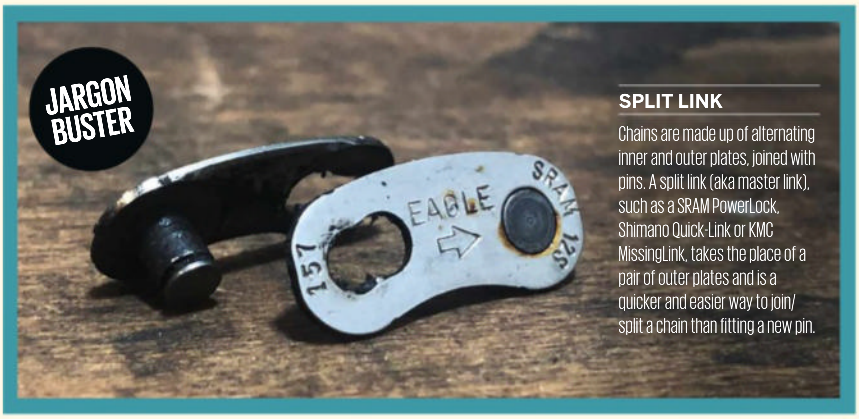
5 Attach the other half of the split link to the other end of the chain, facing the opposite way. Note the directional arrow – this must line up with the direction the chain moves in when pedalling forwards. Push the links together until they lock into place. Tension the chain.



6 Pedal the cranks forwards until the split link is on the upper part of the chain, between the chainring and cassette. Hold the rear brake on while pushing down on the forward crank arm. When there's enough tension in the chain, the split link will audibly click into place.

7 Remove the strap securing the swingarm to the mainframe (if applicable) and reinflate the shock to the pressure you noted earlier, using a shock pump. Check that the chain isn't slack when in the smallest sprocket. If it is, go back and double-check step two.

JARGON BUSTER



SPLIT LINK

Chains are made up of alternating inner and outer plates, joined with pins. A split link (aka master link), such as a SRAM PowerLock, Shimano Quick-Link or KMC MissingLink, takes the place of a pair of outer plates and is a quicker and easier way to join/split a chain than fitting a new pin.

5 Lubricate a new inner cable (SRAM and Shimano use different types), by pulling it through a cloth impregnated with chain lube. Push the new inner cable through the shifter, then through the outer cable. Pull it taut when it pops out the other end.

6 If you have a Shimano shifter, replace the plastic plug. On a SRAM shifter, refit the cover and reinstall the shifter on the bar. Turn the shifter's barrel adjuster fully clockwise, then two full turns anticlockwise. This will help when adjusting cable tension later.

7 Feed the inner cable through the rear mech and into the groove under the cable clamp. Pull it taut and tighten the cable clamp bolt. Snip off the excess inner cable, leaving 3cm beyond the clamp. Install a cable end. Turn the barrel adjuster until the shifting is smooth.

JARGON BUSTER

BARREL ADJUSTER

This adjusts the tension in the inner cable, to fine tune the shifting. Turning it anticlockwise increases the tension, making the mech quicker to shift into the larger sprockets. As the inner cable 'stretches', you may need to increase the tension to compensate.

TYRE PRESSURES

Grip

Generally speaking, lower tyre pressures provide more traction. A softer tyre has more rubber tread on the ground and thus offers more mechanical grip, especially on soft ground. The tyre also deforms more easily over uneven surfaces like rocks and roots, resulting in less deflection from your chosen line.

Rolling speed

While higher tyre pressures can reduce rolling resistance slightly on smooth terrain, lower pressures can – contrary to popular belief – reduce the energy taken to roll over bumpy ground. This is because a softer tyre transmits less vibration through to the bike's suspension and rider.

Comfort

Again, running lower pressures allows a tyre to absorb small bumps more effectively, which reduces the amount of trail feedback and buzz transmitted to the rider. This helps prevent hand pain and arm pump on long, bumpy descents, and reduces fatigue on long rides.

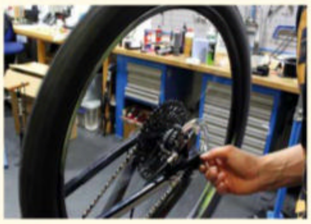
Punctures and squirm

Dropping tyre pressures too low can lead to two main problems. Firstly, tyres can squirm (move laterally) when cornering, causing vague handling. In extreme cases, air can 'burp' out of the tyre. Secondly, tyres are more prone to bottoming out on the rim over rough ground, leading to punctures or dents.

QUICK FIX TIPS Stop your brakes rubbing

1 The easiest way to centre a brake calliper over the rotor is to loosen the calliper mounting bolts half a turn, then pull the corresponding brake lever tightly. Usually, this will align the calliper with the rotor

2 Now comes the tricky bit – retightening the bolts without moving the calliper. The key is to tighten them a little at a time (usually with a 5mm Allen key), alternating between each bolt. This prevents the torque applied from twisting the calliper.



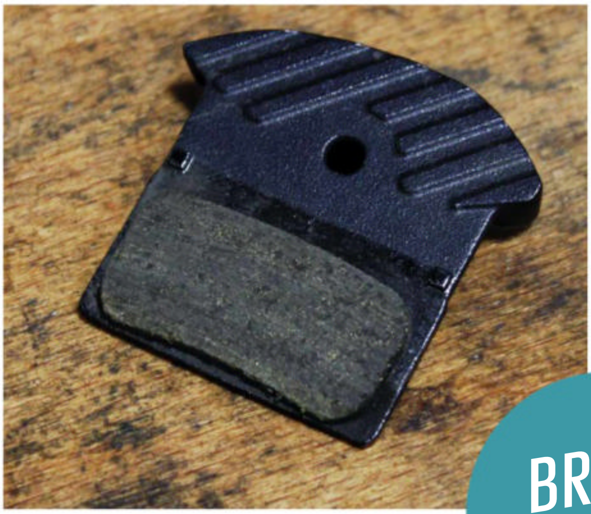
3 Once the bolts are tightened to the correct torque setting, spin the wheel and listen. If the disc is no longer rubbing and is central between the pads, then mission accomplished! If it's still rubbing, move on to step 4.

4 If step 3 didn't work, you'll need to adjust the calliper position manually. Look through the calliper to see how it's misaligned. Loosen one bolt one full turn and swing the calliper until the rotor is central between the pads at that end. Retighten the bolt.

BRAKE PADS

1 Organic

Organic brake pads are generally made up of Kevlar, rubber and silica, bound together with resin. The relatively soft material beds in quickly, remains quiet and provides excellent initial bite, especially at low temperatures. Pad life is short though, and power fades at high temperatures or in wet, gritty conditions.



2 Sintered

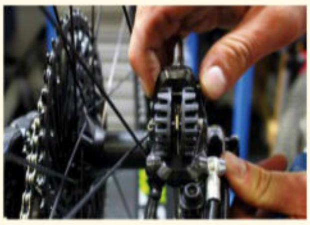
Made of a mixture of metallic particles pressed together, these offer a longer lifespan and better performance in the wet than organic pads. They also conduct heat away from the braking surface more readily and so tend to fade less on long descents. They can be noisy, and often provide little power when cold.

3 Semi-metallic

A compromise between the above options, these include both metallic and organic materials. They offer more initial bite and predictable power than sintered pads, but a longer lifespan and better wet-weather performance than organic pads.

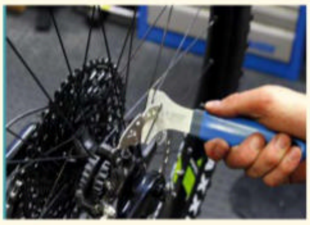
4 Ceramic

Ceramic pads are widely used in motor racing due to their superior performance at very high temperatures. They're seldom seen on bikes, as such temperatures are only reached on very long, steep descents. Those which are available tend to be expensive and use a mix of ceramic and metallic material.



5 Now repeat the process at the other end of the calliper. Loosen the other bolt, swing the calliper until the rotor is central between the pads, then retighten the bolt. Give the wheel a spin. If it still rubs most of the time, repeat steps 4 and 5.

6 If the calliper is aligned but the rotor rubs at one specific point, it may be bent, in which case you'll need to straighten it. Find where the rotor rubs the pads and in which direction it's bent. Rotate the wheel so the bent section is clear of the calliper.



7 Gently pull the bent section away from the direction of the bend, using a rotor truing tool or clean adjustable spanner. Spin the wheel and listen to see if the rotor is still rubbing. If it is, repeat steps 6 and 7 until the rotor no longer rubs.

JARGON BUSTER

BRAKE ROTOR

The brake rotor, or disc, transmits the braking force from the calliper to the wheel, and is designed to dissipate any heat generated as quickly as possible. If a rotor gets too hot or is knocked, it can bend. Bent rotors must be put straight to avoid brake rub and maximise performance.

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